New Forest Life

PARTNERSHIP

LIFE Project Number
LIFE02NAT/UK/8544

Technical Final Report
Covering the project activities from
01.07.2002 to 30.11.2006

Reporting Date
30.11.2006

LIFE Project Name
Sustainable Wetland Restoration in the New Forest (LIFE 3)

Data Project	
Project Location	New Forest
Project Start Date	01.07.2002
Project End Date	30.11.2006
Total Project Duration	53 months
Total Budget	€3,811,807
EC Contribution	€1,524,723
(%) of Total Costs	40
(%) of Eligible Costs	40
Data Beneficiary	
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Final report

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Map 1 Project restoration actions 13/14 ¶
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Figures

2. Key words and abbreviations

2.1 Key words

Bog woodland; riverine woodland; New Forest; Inclosure; lawns; lowland valley mires; river restoration; stakeholders; wetland habitats; Habitats Directive; Water Framework Directive

2.2 Abbreviations

BARS	Biodiversity Action Reporting System
BBC	British Broadcasting Company
BMWP	Biological Monitoring Working Party
cSAC	candidate Special Area for Conservation
CIWEM	Chartered Institute of Water and Environmental Management
EA	Environment Agency
EIA	Environmental Impact Assessment
EMT	External Monitoring Team
EN	English Nature
ES	Environmental Statement
EWF	Emergency Work Force
EPRO	Environmental Platform for Regional Officers
DEFRA	Department for Environment, Food and Rural Affairs
FC	Forestry Commission
GIS	Geographical Information System
HCC	Hampshire County Council
HLF	Heritage Lottery Fund
LWD	Large Woody Debris
NT	National Trust
NFC	New Forest Committee
NFDC	New Forest District Council
NFCP	New Forest Consultative Panel
NPA	National Park Authority
NVC	National Vegetation Classification
PMT	Project Management Team
PRIMER	Plymouth Routines In Multivariate Ecological Research
PSA	Public Service Agreement
RBD	River Basin District
RBMP	River Basin Management Plan
RDB	Red Data Book
RSPB	Royal Society for the Protection of Birds
RWG	Regulations Working Group
SAC	Special Area of Conservation
SAP	Standard Administrative Provisions
SuRCasE	Sustainable River Catchments for the South East
SSSI	Site of Special Scientific Interest
WBMF	Water Basin Management Forum
WFD	Water Framework Directive
WISKI	Water Information System Kisters

3. Executive summary

Project objectives

1. To restore 604 hectares of priority interest features of the New Forest SAC and their supporting adjacent habitats in accordance with the SAC Management Plan
2. To establish the long term sustainability of all six water basins through the development of a mechanism which ensures their integrated management
3. The creation of suitable conditions for the regeneration of a significant further area of priority habitat.

Key deliverables and outputs

- 261 hectares of riverine woodland (Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior)* restored to unfavourable recovering condition
- 18 hectares of bog woodland restored to unfavourable recovering condition
- 184 hectares of mires – incorporating alkaline fens and transition mires restored to unfavourable recovering condition
- 141 hectares of wet grassland – *Molinia* meadows on calcareous, peaty or clay-silt-laden soils (*Eu-Molinion*) restored to unfavourable recovering condition
- A Water Basin Management Forum established to facilitate the informed and integrated management of the New Forest SAC water basins at every level
- Suitable conditions created for the regeneration of a significant further area of priority habitat.
- 10 km of river restoration

Introduction

The New Forest is located in the county of Hampshire in southern England. The wet woodlands within the New Forest occur as part of a successional series of wetland habitats and as such are totally dependent upon their local hydrological regime. The greatest threat to the four SAC priority habitats has been the lack of a holistic approach to the hydrological networks that support their existence.

LIFE – Project Framework

The logic framework contained within the project application was used as a first point of reference, with details of specific tasks being worked out as the project progressed. A detailed project management schedule, including meetings, claim periods and deadlines for reports/claims was prepared by the beneficiary and sent to partners along with a comprehensive project handbook which set out how HCC would work with the partners. A system of claiming and reporting was devised by the beneficiary for the partners' use.

Progress, results

The LIFE 3 project has achieved an impressive range of actions during its duration, and has successfully completed the project's objectives on time and within budget. Hampshire County Council (the beneficiary) and the five partners - English Nature, the Environment Agency, the Forestry Commission, the National Trust and the Royal Society for the Protection of Birds came together to form a very successful partnership to implement the project. Riverine woodland (269 hectares (ha)), bog woodland (20 ha), wet grassland (141 ha) and valley mires (184 ha) were restored from unfavourable declining to unfavourable recovering condition. English Nature is pleased with the achievements of the LIFE project, which has made a significant contribution to on-the-ground delivery of nature conservation objectives in the New Forest SAC.

The Water Basin Management Forum was successful in involving local stakeholders in work plan formulation, decision-making and giving feedback on progress. Regular on-site consultations have helped to raise and resolve any potential conflicts. The Forum has proved so important to positive delivery that the Forestry Commission have agreed to continue to engage with stakeholders beyond the end of the project. A major output of the Forum was the preparation of a 10 year wetland management plan.

A range of survey work was undertaken to inform the planning and design of the river restoration and estimating flood risk. This included baseline surveys of topography, geomorphology, hydrology, macro-invertebrates and fisheries.

High quality work has been carried out to restore remaining riverine and bog woodland to an improving condition. Considerable links between pre-Inclosure riverine and bog woodland and nearby networks have been restored, particularly along the Black Water and the Highland Water. Re-alignment of fencing has allowed the introduction of grazing by Commoners' livestock, to both the river corridors and the priority habitats as well as over 1000 hectares of woodland, furthering the benefits to the wider SAC. Restoration of mires and lawns has been completed by the Forestry Commission, following extensive consultation with the Commoners and the Verderers of the New Forest.

River restoration work totalling 10 kilometres (km) has been successfully carried out by the Environment Agency along the Black Water and the Highland Water. This is one of the largest river restoration projects in the UK. Work has included the re-connection of old meanders, raising of bed levels, and installation of debris dams. Post-restoration topographical information was used to indicate the river planform after completion of works.

A very detailed monitoring programme was undertaken by Southampton University on the geomorphology, hydrology and hydraulic processes of the Black Water and Highland Water. The results broadly showed that the restoration has had detectable impacts across the hierarchical scales of riverine ecology from catchment to feature to patch.

The communication work of the project has been very successful, reaching a wide range of targeted audiences. The appointment of a Communications Co-ordinator was a great asset to the project, involving the preparation of a communication strategy, design of a dedicated website and leaflet, and the production of regular press releases and newsletters.

Project management systems were set up early on, and a sound project partnership was formed. The preparation of partnership agreements and a project handbook helped to introduce formality, structure and discipline to the way the project was managed. Systems for partners to submit technical reports, financial claims and variance requests were successfully devised and have subsequently been refined. The project has been recommended as an example of good practice in project management by the External Monitoring Teams (EMT) to new LIFE projects, which have requested advice on project set up, and the LIFE 3 project has willingly shared its tools / systems with these new projects.

Valuable ecological survey and monitoring work was carried out, including macro-invertebrates, fisheries and wading birds. The latter survey, undertaken by the RSPB in 2004, highlighted the importance of the New Forest for breeding waders, which have nationally and regionally important populations there. The project team have been given valuable support and advice from the UK External Monitoring Teams.

Evaluation and conclusions
The project achieved its objective of restoring the 604 ha of key wetland habitats. These were located within a larger area of SSSI units, totalling 1330 ha and divided across 35 sites, which were found to have reached unfavourable recovering condition as a result of the project.

Comments on financial report
The project succeeded in achieving its aims and objectives within the budget. The overall expenditure was €3,811,807, which was €772,456 (or 17%) below the anticipated total of €4,584,263 as contained in the application. The under-spend was attributed mainly to a combination of costs proving lower than estimated, partners using different approaches to achieving the actions (which proved more cost-effective) and changes in the Euro/pound sterling exchange rate.

4. Introduction

4.1 Background to project

The New Forest is located in the county of Hampshire in southern England. In 1995 the UK Government proposed 29,000 hectares (ha) of the New Forest as a candidate Special Area of Conservation (cSAC). The SAC designation was confirmed by the UK government in 2004. Amongst a variety of qualifying interests, two European Priority interests - residual alluvial forests and bog woodland, are represented.

The New Forest hosts one of only four sites of bog woodland in the UK considered to be of sufficient size, structure and function to merit selection; and one of the best of six sites of ancient residual alluvial forests in the UK. Whilst these habitats currently represent small fragments of the New Forest SAC, they represent particularly rare examples of their kind.

4.2 Overview of main conservation issues being addressed

The wet woodlands occur as part of a successional series of wetland habitats and as such are totally dependent upon their local hydrological regime. The greatest threats to the SAC priority habitats are:
1) The lack of a holistic approach to the hydrological networks that support their existence. A previous LIFE project also highlighted the urgent need to review the hydrology of the New Forest SAC as a whole, rather than piecemeal, mire by mire. A good understanding of how to manage the overall SAC hydrology and how to achieve long term effective restoration of these habitats was identified as being essential. These issues were highlighted in the final technical report for the LIFE 2 project and in sections 2.8, 3.4, 3.5 and 3.6 of the SAC Management Plan.
2) Land users, land owners and the public remaining unaware of the threats to the priority habitats of the New Forest SAC
3) Damaged hydrology
4) Riverine woodland, bog woodland and adjacent habitats damaged by the direct and indirect effects of forestry and other management practices
5) Non-native invasive species requiring eradication and native invasive species requiring management.

4.3 Objectives of the project

Specific objectives

The project actions were undertaken within three of the six main water basins of the New Forest SAC: the Lymington River; the Avon Water and the Hampshire Avon. The specific objectives were:

- To restore 604 hectares of priority interest features of the New Forest SAC and their supporting adjacent habitats in accordance with the SAC Management Plan
- To establish the long term sustainability of all six water basins through the development of a mechanism which ensures their integrated management
- The creation of suitable conditions for the regeneration of a significant further area of priority habitat.

Expected results

- The establishment of a mechanism to facilitate the informed and integrated management of the New Forest SAC water basins at every level
- Conservation objectives for the priority habitats of the New Forest SAC supported by the public and a cross-section of local interests, land owners/occupiers and land managers
- 261 hectares of riverine woodland (Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior)* restored to favourable or unfavourable improving condition
- 18 hectares of bog woodland restored to favourable or unfavourable improving condition
- 184 hectares of mires - incorporating alkaline fens and transition mires - restored to favourable or unfavourable improving condition
- 141 hectares of wet grassland - *Molinia* meadows on calcareous, peaty or clay-silt-laden soils (*Eu-Molinion*) restored to favourable or unfavourable improving condition
- To deliver the project to professional standards of project management within the budgetary, timetabling and quality standards of the EC

5. LIFE-Project logic framework

5.1 Time planning

The logic framework, taken from pages 21/1-21/2 of the application (see Annex 9.1), was used as a first point of reference, with details of specific tasks being worked out as the project progressed. A detailed project management schedule, including meetings, claim periods and deadlines for reports/claims was prepared by the beneficiary and sent out to partners during autumn 2002, along with the project handbook.

The system of claiming and reporting was devised by the beneficiary for the partners' use, and was based on a four-monthly reporting period, designed to bring reporting and claiming in line with the start of the financial year (1 April).

The project was managed via a project management team (PMT), meeting on a four-monthly basis. The standing agenda for the PMT included a project management & financial review, partners' progress reports, work plans, variances and WBMF agenda. The meetings were organised, chaired (and normally hosted by) Hampshire County Council (the beneficiary). The agendas and minutes of the PMT are contained in Annex 9.12.

5.2 Project phases and activities

The project can be divided into the four phases, although there was some overlap between the first three phases.

Figure 1 - Project Phases

Number	Phase	Actions	Timing
1	Set up	A1.1-1.6: prepared terms of reference for WBMF; F1.1-1.6: produce partnership agreement, project handbook, inaugural PMT mtg.; E1.1-1.6: preparation of communication strategy; hold launch event	July – Dec 2002
2	Planning & design	A3.1: carry out hydrological, geomorphological & topographical surveys; F2.3 biological surveys; survey, mapping, plan preparation & consultation for practical actions C1.1, C2.1, C2.2, C3.1, C4.1, D2.1; design & production of interpretative media: E3: leaflet; E4: website	Jan – June 2003
3	Implementation (includes monitoring & control>adjustment & risk management loop)	Forum: A1.1-1.6: preparation of partners' work plans & 10 year integrated water basin management plans; Habitat restoration: C1.1, C2.1, C2.2, C3.1, C4.1, D2.1; Public awareness & dissemination: E1.1-1.5; E2.1-2.5; E3; E5.1-5.3; Overall Project Management: F1.1-1.5; Monitoring: F2.1-2.4	July 2003 – July 2006
4	Completion and evaluation	F1.1-1.5: production of Final Report, Layman's report, Final Claim & Statement of Expenditure; completion of project administration procedures.	Aug – Dec 2006

5.3 Presentation of Beneficiary, partners and project-organisation (organigram: functions and tasks, persons and companies)

Organigram

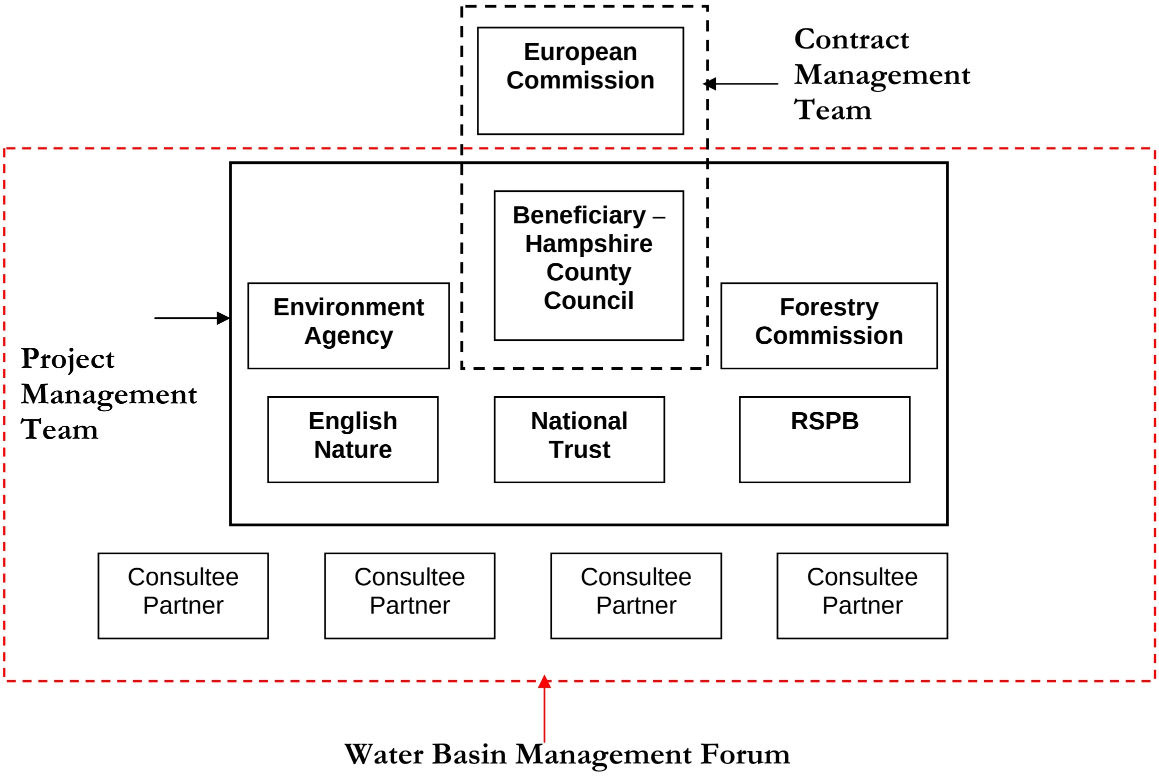
Figure 2 below illustrates the three levels of management and accountability within the project. Firstly, HCC, as beneficiary of the LIFE-Nature grant, had a contractual relationship with the European Commission. An internal HCC contract management team, including officers from the Finance Department, met each month to plan ahead and monitor progress.

Secondly, the partners guided the work of the project and raised contractual issues with HCC via the PMT. At the third level, all partners sat on the Water Basin Management Forum, together with representatives from additional organisations and individuals with particular interests or expertise in the New Forest and its wetlands.

These included: Brockenhurst College, Brockenhurst Manor Fly Fishing Club, the Commoners' Defence Association, Hampshire & Isle of Wight Wildlife Trust, New Forest Association, New Forest Association of Local Councils, New Forest District Council, Southampton University, Southern Water and the Verderers of the New Forest.

The overall project management was described in detail in the project handbook. A list of project staff members within each partner organisation was included in Appendix 4.14 to the year 1 progress report.

Figure 2 – Project Management Structure (Organigram)



5.4 Description of modifications to initial proposal (technical, financial, project-organisation)

No substantial amendments to the project have been made. During the course of the project there have been some minor variations made to staff and project implementation mechanisms, as partners re-assessed the scope of work and the skills required to do the job effectively. These have all been managed within the limits defined by Article 13 of the SAP. Occasionally advice or clarification on how to interpret the SAP has been requested from the project monitors, who have been very helpful. The minor changes have been reported on in the three progress reports and in the interim technical report.

6. Progress, results

The table below summarises the results.

Deleted: Map 1, after page 13, shows the location of the practical actions.¶

Figure 3: Summary table

Action Ref.	Name of action	Activity	Overall target output	Amount completed to date	% com-pleted	Planned completion date	Actual Completion date	By whom (lead)
A1.1-1.6	Water Basin Management Forum	WBMF	12 full day mtgs.	12 half day mtgs. and 2 day event	100			FC
			Minutes and copies of work programmes for Year 1	Minutes and copies of work programmes for Year 1	100	31/12/02	30/06/03	
			Minutes and copies of work prog's for Year 2	Minutes and copies of work prog's for Year 2	100	31/12/03	31/07/04	
			Minutes and copies of work prog's for Year 3	Minutes and copies of work prog's for Year 3	100	31/12/04	31/07/05	
			Minutes and copies of work prog's for Year 4	Minutes and copies of work prog's for Year 4	100	31/12/05	31/07/06	
A3.1	Detailed physical surveys of the upper Lymington river and adjacent floodplain	Topographical maps complete with plan and section drawings, linked to Arcview GIS, of target rivers	1 survey	1 survey	100	31/03/03	30/06/03	EA
		Geomorphological maps of the target rivers, with accompanying reports of analysis and interpretation	1 survey	1 survey	100	31/3/03	April 2003	EA
		Hydrological database with accompanying summary report and interpretation for target rivers	1 survey	1 survey	100	30/06/03	31/12/03	EA/ So'ton Uni.

C	Non-recurring management							
C1.1	Ensure the favourable condition of riverine woodland and stimulate natural succession	Restoration of remaining areas of riverine & bog woodland within A&O woodland	i) Restore 53 ha habitat.; ii) pollard 885 trees; iii) 2000m fencing iv) 2000 m hedge planting	i) 99 Ha RW ii) 858* trees iii) 1880 m fencing*; iv) 898 m hedge planting*	i) 100 ii) 97 iii) 94 iv) 45	30/06/06	31/07/06	FC
C2.1	Restoration of links between pre-Inclosure riverine & bog woodland & nearby networks & stimulate natural succession on the Crown Lands	Restoration of riverine & bog woodland along the Lymington river & Avon Water corridors; recovery of pre-inclosure habitats within FC Inclosures Fence removal New stock fencing Deer fencing	Removal of conifers & other exotics, 222 ha 15,246 m 5,938 m 8,000 m	222 ha (RW=163 ha; BW=20 ha; remainder restored to heath/grass -land) 17,258 m** 5,666 m** 6,166 m**	100 100 95 77	30/06/06	31/07/06	FC
C2.2	Restoration of links between pre-Inclosure riverine & bog woodland & nearby networks & stimulate natural succession on the National Trust Land	Rest'n of links between pre-Inc. riverine & bog woodland & nearby networks	Remove conifers 16ha	16ha (RW/BW = 4.1 Ha; VM = 6.6 Ha; remainder restored to dry heath)	100	30/06/06	March 06	NT
C3.1	Restoration of periodic inundation patterns in the upper catchments to maintain stream water levels throughout the year on the Crown Lands	Restoration of valley mires Restoration of Inclosure mires (C2.1) NT Mires	154 ha 30 ha 6 ha	143.1 ha 34.8 ha 6.6 ha	100 (all mires)	30/06/06	31/07/06	FC
C3.1	"	Restoration of wet grassland (lawns) New stock fencing	141 ha 1,400 m	141.5 ha 742 m***	100 53	30/06/06	31/07/06	FC
C4.1-C4,3	River habitat restoration work to protect and enhance Natura 2000 priority habitats	River restoration Phases 1-3	10 km	10 km	100	31/12/05	Oct '05	EA
C4.3	"	Maps, accompanying reports & interpretation of topographical levels, geomorphological, hydrological & biological attributes, fish communities &	5 reports	3****	80	31/03/06	31/08/06	EA

		macro invertebrate communities of the Black Water & Highland Water for Phase 3						
D2.1	Recurring management	Restoration of riverine woodland – programme to coppice trees alongside the Dockens Water	1 km (= 1 ha RW)	1 km (=2.8 ha RW)	100	30/06/06	March 06	NT
F1.1-F1.6	Overall project operation and monitoring	Overall project management	Provide copies of PMT mtg. minutes & technical reports	Copies provided	100	31/08/03 31/08/04 31/08/05 31/08/06	31/08/03 31/08/04 05/03/06 Nov 2006	HCC
F2.1	Overall project operation and monitoring	Ecological monitoring of the aquatic environment	1 Fisheries survey 1 macro-invert survey	1 Fisheries survey 1 macro-invert survey	100 100	31/3/04 31/3/04	31/10/03 30/11/03	EA
F2.2	Overall project operation and monitoring	Monitoring of project performance	Habitat mapping; set transects; photography	Aerial photographs taken; Fixed point photographs taken.	100	30/06/06	31/07/06	FC
F2.3	Overall project operation monitoring	Wading bird survey	1 survey, 2004	1 survey, 2004	100	2004-05	30/06/04	RSPB
F2.4	Overall project operation and monitoring	Surveys & photographic monitoring	1 monitoring report	1 monitoring report	100	30/06/06	31/07/06	NT

* See text under action C1.1, page 17.

** Some changes were made to quantities of fencing required - see text under action C2.1, page 19-23, for further details and explanation.

*** See text under action C3.1, page 28.

**** The EA have not produced a "formal" physical survey report for C4.3 "during" works - the final survey reports cover all phases of the river restoration. The most recent topographical work was used to inform the design, modelling, and river restoration works, and provide a GIS planform (see Annex 9.17). Geomorphology and hydrology are covered in separate reports (under Action C4.1-4.3) by Southampton University and the Environment Agency (see Annexes 9.16 & 9.18). The macro-invertebrate and fisheries surveys are covered under Action F2.1.

6.1 Preparatory actions, elaboration of management plans and/or action plans

6.1.1 Action A1.1 – 1.6: – Water Basin Management Forum

Expected result: the establishment of a mechanism to facilitate the informed and integrated management of the New Forest SAC water basins at every level.

Indicators used to test the performance of the action:
1) A Forum is established
2) Management of the New Forest SAC water basins becomes more informed and integrated
3) Production of a 10 year Implementation Plan (Wetland Management Plan)

Progress
An initial meeting to scope the Forum was held between EA, FC and HCC officers during November 2002. An independent chairman, Dr Alan Drinkwater, and an administrative officer were appointed by FC, who led on this action through their Recreation Manager and who provided the Secretariat for the Forum during the project's duration. The format and method of operation of the Forum was modelled closely on that of the Forest Design Plan Forum, which was developed under the previous Life 2 project. An analysis of appropriate stakeholders to participate in the Forum was carried out and representatives from 20 key organisations were invited to the inaugural meeting was held on 22 January 2003. The proposed terms of reference and method of working for the Forum were discussed and agreed. Details of the above can be found in Appendix 4.1 to the year one progress report.

A pattern of 3-4 meetings per calendar year was established, comprising a work planning meeting in February; a site meeting in May/June to review work carried out; and an autumn meeting to further review past work and to look ahead to the coming winter's work programmes. Meetings were limited to half days to allow members to make time within their busy schedules, and this ensured a good continuity of attendance. Each meeting was comprised of a combination of information presentations on specific topics, e.g. debris dams; review of work completed since the previous meeting; discussion of future work proposals; and updates on the wider communication of the project.

The educational presentations on various topics were well received by members and led to more informed debate on the work proposals. Supporting plans for each partner's work were provided to members in advance of meetings, then debated by the Forum. Initially, most of the members' concerns related to the method of implementation rather than the principles of the work, although the mire restoration required additional careful negotiations on-site with those who represented commoning interests. As work progressed and members could see some sites being restored, they became more understanding and comfortable with the techniques applied. Some proposals e.g. deer fencing, were altered in light of comments received by Forum members.

The series of visits to sites were particularly helpful in explaining the issues, demonstrating the methods applied, and in providing some very useful feedback to the partners on work plans. Repeat visits to sites after completion of work were also helpful to confirm to Forum members that work had been implemented as previously discussed. Members were regularly updated on how the work of the project had been disseminated (through newsletters, websites and other meetings). The Forum acted successfully as a mechanism for wider communication and dissemination of the project's objectives and results. Copies of minutes from the Forum meetings were included in the yearly progress report appendices, with minutes of the latest meetings being included in Annex 9.2 of this report.

In order to prepare plans for mire and lawn restoration and support the foresters in Forum consultations, a full-time ecologist (Simon Weymouth) was employed rather than use contract staff. This was a slight departure from what was originally foreseen in the Application, in order to achieve a greater degree of control of actions, more integrated survey and practical management, and better co-ordination of work. A second ecologist (Jane Smith) was engaged in the final year of the project to prepare the Wetland Management Plan (see below).

Following discussions at the Forum regarding partners' statutory duties in the New Forest, and the need to obtain appropriate consents and resolve potential conflict resulting from the project, a Regulatory Working Group (RWG) was set up, comprising officers from EA, EN, Verderers and FC. Its aims were to investigate the types of statutory consents required to implement project work and how to achieve these most efficiently when several regulatory bodies may be involved. The work of this group was later absorbed into a wider review of consultative groups in the New Forest. The final indoor meeting was held on 1 March 2006.

A ten year Wetland Management Plan (referred to as the Implementation Plan in the Application) was prepared for the six catchments within the Forest. The scope and content of the plan were discussed with the Forum and agreed. The final document was divided into seven sections. Part one gave the background to the wetland topic, the purpose of the plan, the legislative setting within the Water Framework Directive and how the plans might fit within the emerging national commitments under the Directive by the EA. Part two covered the historic legacy and the past management of the areas wetlands, including the associated conflicts which had led to the present day situation. Part three covered a comprehensive range of catchment characteristics, including climate, soils, vegetation, land use and legislation, plans and strategies. Part four of the plan focussed on restoration works, including a summary of works carried out to the end of the Life 3 project within three out of the six catchments; possible future works for all six catchments; potential costs based on unit costs established from experience during the project's implementation; a summary of restoration techniques used to date; actions needed to maintain the habitats restored via the Life 3 project; and a summary of issues/actions and priorities. Part five contained a series of case studies, based on the restoration of different habitats at various sites. Part six included a list of references and part seven contained a glossary of technical terms. There was also a comprehensive set of appendices (see Annex 9.24 for the full plan).

An abridged version of the plan - the 'Practitioner's Guide' – was produced in September '06, and was aimed at practical site managers. A copy is included in Annex 9.25 to this report.

Feedback on the Forum's success received from members at the last meeting included the following comments: "the most exciting thing to have happened since the Forest Design Plan exercise" and "it had been an excellent consultation process". A final site visit was held on 9 May 2006, including Holly Hatch, Dockens Water, and the Markway area.

The total actual cost was €129,678, compared with an estimated cost of €171,098.

Conclusion
The A1.1 to A1.6 actions have been completed successfully - the Forum was established; through the process of the meetings the members and their constituents became better informed; management of the water basins subsequently became more integrated through the members communicating and working together, and via the production of the Wetland Management Plan. Through the above actions, threat 1 'Weakly integrated management of the habitats within the six water basins of the SAC' was effectively addressed. Threat 2 (see paragraph 4.2, page 6) was partly addressed via the Forum by the inclusion of representatives from land user organisations (e.g. The Ramblers, Brockenhurst Fly-fishing Club), and land managers (e.g. Commoners and Verderers), all of which became much better informed about the problems facing the wetlands, and supportive of the actions required to conserve and restore them. All partners except HCC had budget allocations under A1.1 - A1.6.

6.1.2 Action A 3.1 Detailed Physical Surveys of the Upper Lymington River and Adjacent Floodplain

Expected result: Detailed topographical, geomorphological and hydrological surveys to be carried out of the upper Lymington River and Adjacent Floodplain.
Indicator: Survey reports produced, with maps, diagrams, GIS data.

Progress
All three of the initial baseline surveys had been carried out by the middle of year two. These were vital for designing the river restoration work, and proved valuable in informing the WBMF about the condition of the upper Lymington tributaries, and in feeding into the development of partners' work plans.

(i) Geomorphological survey

The Department of Geography and GeoData Institute of Southampton University completed their geomorphological audit of the Highland Water and the Black Water during spring 2003.

Amongst the report conclusions was evidence of:
1. Substantial modification to both rivers, with some 44% of the Highland Water and 78% of the Black Water having been modified.
2. Very little natural restoration taking place.
3. Lowered frequency of debris dams in the channelised & modified reaches.

The report suggested a range of restoration options that would initiate a semi-natural pattern of connectivity between the channel and floodplain. The report's recommendations, with GIS mapping, were incorporated into the Agency's river restoration plans. The survey report and GIS maps were included in Appendix 4.3 of the year one progress report.

(ii) Topographical survey
Topographical maps, complete with plan and section drawings, linked to Arcview GIS, of target rivers were produced by March 2003. These helped to inform the Agency's project design, modelling, river restoration plans and operations. The survey report and GIS maps were included in Appendix 4.2 of the year one progress report. As the actual costs quoted by the contractors were higher the originally estimated, the topographical survey work was divided between the contractor (Halcrow Ltd) and Agency staff, and the work was divided into phases. The survey work was conducted by Agency staff on the proposed restoration site at Blackensford, and on the restored section of the Highland Water, early in 2005.

(iii) Hydrological survey
The Environment Agency set up a Flood Impact Assessment group, including EA flood defence staff, regional staff, Dr David Sear from Southampton University, and external consultants. The group met seven times during the period, as it was necessary to carefully examine potential flood impacts of the LIFE 3 restoration works, and ensure that proposals demonstrated net flooding benefits. A critical analysis of hydrometric data, undertaken by the EA, with input from Southampton University, suggested that there would be net flooding benefits, but was unable to rule out the risk of an increased flood peak.

The consultants Halcrow were then employed to model what was considered the worst case scenario, using the Flood Estimation Handbook. The modelling results suggested that the impact of the Life3 restoration works could not cause an increase in the flood peak, and that flood risk to downstream properties was likely to be slightly reduced, as peak flows would be attenuated, but this effect would not reduce the extent of major flood events. Combined with the data analysis, the results indicated that the restoration could move ahead, with a high level of confidence.

A hydrological summary was undertaken by EA. The report, with interpretation for the target rivers, was included in Appendix 4.2 of the year two progress report. The report summarised the catchment characteristics, the hydrology and hydrometry, and the geomorphology. A technical summary of the hydrometric equipment and data quality was included. Data from the catchment was stored on the EA hydrometric archive (WISKI), from which data was supplied as necessary.

It was impractical to provide a database as part of the hydrological summary report due to the vast quantities of data stored (data was collected at five minute intervals). Monthly data downloads and spot gaugings were made during the project's duration. Hydrological analysis of the data showed that the streams were typical New Forest streams. They were responsive, with steep rising and falling limbs, high peaks, low base-flow, and in summer conditions are prone to drying out.

The total actual cost of action A3.1 was €127,930, compared with an estimated cost of €148,320.

Conclusion
The detailed topographical, geomorphological and hydrological surveys were carried out on the upper Lymington River and adjacent Floodplain, and these provided valuable baseline information which was used to guide the preparation of partners' work plans.

6.2 Non-recurring biotope management

6.2.1 Action C1.1: Ensure the favourable condition of riverine woodland and stimulate natural succession

Target habitats/ species	Riverine woodland (alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior)* and bog woodland
Measurement definition	Area restored via scrub clearance, removal of exotics, holly management & river restoration
Total area completed	98.7 ha

By the end of year four, a total of 98.7 hectares of riverine woodland within the Ancient & Ornamental (A&O) Woodland had been restored through scrub clearance, the removal of exotics, pollarding of some 679 trees, holly management and restoring floodplain processes (see summary table, page 10). Work was carried out along the Lymington River, Avon Water and Dockens Water (Hampshire Avon Basin). The results can be seen on the map in Annex 9.3. Before and after photographs of some of the work can be seen in Annex 9.22.

Coppicing and pollarding of holly was undertaken to increase light levels within the woodland, and significant increases in light penetration were achieved. This has encouraged the development of lichen communities and ground flora. A good example of this can be found at Mark Ash Wood, which has been continuously wooded for at least 7000 years. The wood is rich in epiphytic lichens and is one of the best areas in Europe for these, with 206 species. Additional benefits of the works included an increase in the deadwood habitat, the supply of floodplain material to aid debris dam formation and the provision of winter browse for commoners' animals. In combination with the holly management, new pollards were created by cutting oak, beech and ash above the browsing level of commoning stock.

A total of 885 pollarded trees was contained in the application. However, whilst the Forestry Commission team took every opportunity to create new pollards, finding trees of a suitable size in appropriate locations proved somewhat difficult. A total of 679 trees were pollarded within the Ancient & Ornamental (A&O) Woodland, and a further 179 trees were identified and pollarded within the Holmsley and Knightwood Inclosures (C2.1) in order to achieve the target. Therefore a total of 858 trees were pollarded, or 97% of the planned total.

Avon Water catchment

At Holmsley Bog willow scrub totalling 1.9 ha was cleared, initially to create a corridor through the scrub/woodland edge to encourage grazing by livestock on the transition mire community, which had experienced substantial encroachment by willow and alder over the past 50-60 years. Local, smaller-scale felling was also done to favour a colony of the rare slender cotton grass *Eriophorum gracile* and reduce shading by scrub. Before and after photographs of all of the above can be seen in Appendix 4.9 of the year two progress report. Holly pollarding and coppicing (1.7ha), together with pollarding of 71 oak, beech, alder and other broadleaves were undertaken within the catchment.

The Avon Water corridor contains a variety of exotic species including sycamore. After some initial felling, first attempts at extracting proved to be difficult using mechanical methods. Subsequently, a team of horse loggers were employed in early Spring and again in July-August 2005, to complete felling of sycamore along the river corridor and to pull out the felled timber in this sensitive site. A total of 12.4 ha of woodland was cleared of sycamore, with the felling residues being left on site. The clearance of the larger material by heavy horses proved to be of considerable interest to the media, stakeholders and the general public.

At Wootton Inclosure, within the riparian woodland the fen soil is very rich in alluvium. The consequence of this has been over wetting of nearby access routes. The footpath which runs from the underpass to Wootton Brownhills has undergone some additional maintenance, timber boarding was placed underneath the track and this was topped with gravel. Access was a key theme for a number of the stakeholders and actions such as this maintained and improved access through the riverine woodlands whilst limiting erosion and the spread of wear across a wider area of this valuable habitat.

Lymington River Catchment

The holly management was completed in 2006, with work undertaken at Holidays Hill, Lucas Castle, Stoney Moors, Roman Bridge, Little Huntley Bank, Great Huntley Bank, Brinken Wood, Wick Wood, Millyford Green, Cole Bridge, Wood Crates and Ocknell. The work prioritised areas of dense holly where the shade cast was damaging to internationally important lichen communities on the trunks of ancient oak and beech trees. A total of 14.44 ha of holly management was completed. A total of 558 ash, beech and oak trees were pollarded during the lifetime of the project.

Fencing and hedge planting work at Waters Copse (Lymington River basin) underwent a long planning stage since they were part of a plan to re-align a fence boundary to open up a former field to allow access and grazing by commoning stock. The key focus of this work was to alleviate the public pressure on the riverine woodland corridor from camping at the adjacent New Park farm and from walkers restricted to the river corridor by fences. Once agreed with stakeholders, works commenced in Spring 2005, and 1880m of fencing was completed by July 2006. This was less than the 2000m which was originally estimated. FC staff erected three sections of double deer fence to protect existing hedges and supplemented this with new planting.

The old neglected hedge was re-coppiced and supplemented with plantings of hawthorn, blackthorn, hazel, field maple, guelder rose and holly. Oak standards were planted at 25-m spacing. The hedge planting was halted in May 2006 due to the onset of spring, when 898 m had been planted. The planting of the remainder is due to be completed by the end of 2006. Once established, the new hedge will form a more natural barrier and a wider buffer in order to protect the riverine woodland.

Due to historic drainage activities to straighten the watercourse in this area, the Ober Water was no longer interacting with the riverine woodland at Red Rise. Furthermore, the straight channel conveyed material downstream, where it was being deposited at Markway Lawn, causing channel instability. FC (working closely with EN) appointed the consultants Geodata (Southampton University) to assess the geomorphological processes at work and make recommendations for channel restoration (see Annex 9.5).

The recommendations made by Geodata were formalised into proposals to restore the stream channel, which were presented to the WBMF. The work delivered the restoration of 4.4 ha of the Ober Water valley, with the dominant habitat being riverine woodland, but with lesser elements of alluvial wet grassland and wet heath. In addition to the target hectarage, the restoration proposals delivered a meandering river course of 750 metres (compared with the existing straightened channel of 400 metres). The results since the works have been completed have been dramatic. With the floodplain processes restored, the river regularly overtops its bank during periods of peak flow.

Access improvements
At Markway Lawn, the inaccessible footbridge upstream was removed by the FC bridge team in summer 2005. Following this, access to the downstream bridge was enhanced by raising the bridge on its supports by 300mm and improving access to the eastern end of the bridge by providing a new piped causeway. This has enabled people to use the bridge crossing throughout the year, whilst taking pressure off the riverine woodland and lawn surrounding it. The piped causeway enables water to flow across the floodplain width whilst maintaining public access.

The Hapsley Ford crosses the Ober Water on the upstream side. The adjacent mire habitats were causing under-seepage of the track and subsequent surface flooding in very wet weather periods. The material had been washed away from the surface leaving bare clay. To alleviate the problem, timber boarding was laid underneath gravel to act as a firm base. The level of the gravels was raised in the middle of the track so that rainwater could flow quickly off the track and back into side drains.

At Mill Lawn the crossing point at this section of the Ober Water was in a bad state of degradation. This was fixed by remedial works to the existing crossing, by the placement of two additional gravelled sections across the lawn which now direct walkers to use these stabilised sections and prevent further degradation of the lawn habitat.

River Avon Catchment

At Dockens Water, holly pollarding and coppicing totalling 2.8 ha were carried out within the catchment, together with pollarding of 50 broadleaved trees. Before and after photographs of some of the above work can be seen in Appendix 4.7 of the Interim report.

The total actual cost of action C1.1 was €187,850, compared with an estimated cost of €286,371.

Conclusion
Remaining areas of riverine and bog woodland totalling 99 ha were restored to unfavourable recovering condition within the A&O woodlands, via a combination of scrub clearance, removal of exotics, tree pollarding, holly management and restoration of fluvial processes.

6.2.2 Action C2.1: Restore links between pre-Inclosure riverine & bog woodland and nearby networks and stimulate natural succession on the Crown Lands

Target habitats/ species	Riverine woodland and bog woodland
Measurement definition	Area restored via removal of conifers & other exotics; glade creation, thinning & pollarding of broad-leaved trees; disruption of artificial drainage system; fence improvements; restoration of fluvial processes
Total area completed	220 ha of conifers/exotics removed; 183 Ha of riverine/bog woodland restored

The aim of this action was to restore the above habitats along the Lymington River and Avon Water corridors and to link the small pockets of remaining habitat to their surrounding associated wetland habitats and other areas of riverine/bog woodland. Excellent progress was made, resulting in all of the planned work being achieved. Works were completed throughout the Inclosures along which the Lymington and Avon Waters flowed, with conifers and other exotics being removed, drainage systems being in-filled and sites restored to enable them to naturally colonise with native vegetation.

There are some excellent examples of how quickly this can occur. Following the year one work at Highland Water, which was carried out in Feb/March '03, the ecological response was dramatic. The disruption of the drainage pattern allowed more natural seepage flows across the site, which in time will encourage the establishment of a wider range of aquatic plants and invertebrates. (See before & after photos in FC technical report for Dec 2002 - March '03, Appendix 4.9 of year one progress report).

Over 17 kilometres of Inclosure fences have been removed or re-aligned during the project period, opening up 1077 hectares of the SAC to the influence of grazing animals (cattle and ponies). Grazing is essential to the maintenance and development of the riverine woodland, mire and wet grassland habitats and will prevent invasion and dominance of bracken, purple moor grass *Molinia caerula* and scrub.

A variance was initiated following a Water Basin Management Forum field meeting in 2003, which discussed the conservation value of deer exclosure fencing (8000m planned) versus stock inclosure fencing, and concluded that some of the resources would be better used on stock fencing re-alignment to enable livestock to graze, as discussed above. This demonstrated the benefits of the Forum and its ability to shape actions on the ground to better meet the project's objectives. A report on the establishment of riverine woodland and the merits of using deer fencing was commissioned by the consultant Neil Sanderson, and was contained in Appendix 12.7 of the year two progress report. This variance resulted in 4085m of stock fencing being constructed at Highland Water in order to protect recently established conifer plantings and enable the early grazing of the surrounding restored areas, totalling some 324 hectares.

The results of the C2.1 actions can be seen on the map in Annex 9.3. Before and after photographs of some of the work can be seen in Annex 9.22.

Lymington River Catchment

North Oakley including Blackensford (River Black Water corridor)
The aim of this work was to remove all exotics from within the riverine corridor in order to increase light levels onto the stream edges and enable of the natural colonisation of native species. A total of 34 hectares were restored by contractors and FC staff. The work involved the felling, cutting or pulling out of planted conifers and natural regeneration (mainly Douglas fir and Western hemlock) along streamside corridors with work starting in March/April 2005. Chainsaws and clearing saws were used, and all arisings were cut up and pulled back from 500m of streamside. During the winter months the arisings from the cleared areas were raked and burnt with any drainage channels in-filled.

The Blackensford section of this river system was restored by the EA during summer 2005. Ahead of this restoration, FC worked in a narrow corridor on the flood plain to thin out the beech understorey, leaving those trees which may in the future form either mature canopy trees or deadwood. Most of the trees removed were badly damaged by squirrels. The trees needed to be removed to allow machinery access into the woodland for the EA, and to give the remaining trees increased room and light to grow and develop. Following the thinning by contractors, a 360° excavator was hired to rake and burn the debris on the floodplain or remove it uphill. This will now allow the ground surface the opportunity to develop a new ground flora layer.

Vinney Ridge Inclosure (Black Water/Rhinefield)
At Vinney Ridge Inclosure, following rhododendron removal in year one, increased light levels reaching the forest floor had already improved conditions for regeneration of woodland trees and associated ground flora

By the beginning of year two a dramatic change in the landscape was achieved via the removal of an area of Norway spruce from the floodplain along the river Black Water. With the spruce removed from c. 50 metres either side of the river, the light now reaches the river and the remaining broadleaved trees. The felling was done during July when the ground conditions were dry, making use of machinery for extraction of timber easier than if the work had been delayed to autumn/winter. The removal of the trees then allowed the EA to come in and carry out Phase 1 of the river restoration. Follow up work by FC, including burning arisings from felling, drain in-fill and herbicide treatment (using Glyphosate) of rhododendron and pulling up of small conifer (spruce/hemlock) saplings, has been completed.

Four deer exclosure plots were erected within the clear felled area upstream of the Black Water car park. The aim of these plots was to assist the developing natural regeneration of native riverine woodland habitat. The plots will also be used to monitor browsing pressure and regeneration success compared with unfenced areas on the same site. Plots are approximately 25m x 25m square. Within this Inclosure 16.3 hectares of riverine woodland were restored, 1.4 hectares of rhododendron cleared and 400 metres of deer fences erected.

Highland Water & Holmhill Inclosures

Work started early in 2003 to remove all exotics from within riverine/streamside corridors (between 5-25 metres) and to increase light levels onto the stream edges. The work involved felling with chain saws, and cutting or pulling out of seedlings/saplings. All arisings were pulled back from the streamside. Any rhododendron and Turkey oak in riverine areas was also cut. Following the clearance, debris was raked and burnt with any drains in-filled with locally won material, heather. Heather bales were used at drain ends to avoid any potential siltation of the watercourse. A total area of 29 ha were restored.

A stretch of approximately 2070m of inclosure fence was removed around Puckpits Inclosure and part of Highlands Water Inclosure to allow grazing on the emerging mire habitat and riverine woodland. The alignment of the new fence on the old Inclosure bank around Holmhill has been completed, with a total of 1832m having been erected. The fence was a standard Inclosure fence, with 4 line wires and 5ft stakes. Some trees had to be cleared from the bank prior to erecting the fence. All woodwork and wire was removed from site. This now allows grazing to occur in the 324 hectares of Highlands Water, while Holmhill Inclosure can remain un-grazed.

Slufters Inclosure - riverine work

A total of 20.8 hectares of riverine woodland and mires were restored within Slufters Inclosure. Work started in 2003 with the clearance of conifers from riverine and wetland mire habitat. At this time heather bales were cut as part of the open forest maintenance programme in readiness of the subsequent drain in-fill. In 2004 work commenced to rake and burn the residues from the clearance operation and in-fill the extensive drainage channels with heather bales, clay plugs and locally won material. Finally some 3260 metres of fencing was removed to allow the unobstructed movement of commoning stock to graze the emerging habitats. In addition a new pony pound was constructed on the edge of the Inclosure to help facilitate the management of commoning stock following the extensive removal of fences across the project area. The new pound will help Commoners manage their stock in the absence of the once more extensive fences. The work resulted in the restoration of some 10 hectares of mire habitat and a further 10.8 hectares of riverine woodland.

Dames Slough

Similar to the previous sites, at Dames Slough the floodplain was cleared of non native species with the arisings being raked and burnt and the main drains filled using some of the larger logs and the original spoil removed when they were dug. Heather bales were used to block the lower ends of the drains. The fire sites were rounded up so as to burn all the heaped material. Contractors carried out the work using an excavator. A total of 24.7 ha was restored. In addition some 71 hectares of adjacent broadleaved woodland was cleared of Turkey oak.

Deer fencing work involved the dismantling of part of the existing fence along the watercourse to allow access for river restoration work. Furthermore, it included the erection of a stretch of new Inclosure fence and the erection of deer exclosure fences using some of the existing fence. 1051 m of new fence was erected; 1937 metres of fences were removed and 675 metres of new deer fences were erected around the deer exclosure plots.

Combined with the EA's work the restoration has seen impressive results, resulting in the full floodplain being inundated with water at peak flows. The responses of the emerging habitats are also encouraging, with new alluvial grassland developing alongside a riverine woodland.

Knightwood Inclosure
Knightwood Inclosure was cleared of invasive and heavy shade bearing Western Hemlock regeneration that was starting to dominate the Inclosure and threaten the development of the wetland habitats. Some 75 hectares of woodland were cleared with work starting in the autumn of 2003. In addition some areas of spruce were cleared by FC staff and contractors with the arisings being heaped and burnt. During the works, 179 new alder pollards were created. Following this, 800 metres of fence realignment was carried out during December 2004-March '05, completing the fence realignments where the deer fence around the area of riverine woodland adjoining Holidays Hill Inclosure was taken down. This work will enable light grazing to influence the future development of the woodland.

Markway Inclosure
An area immediately adjacent to Markway lawn was cleared of harvesting residues and drains in-filled. This area provided a natural extension to the lawn and is developing as predominately wet heath with mire vegetation in the wet flushes and areas of alluvial grassland. This area as well as a previously restored mire system to the north was opened to unobstructed grazing by the removal of 1524 metres of fence line.

Avon Water catchment

Holmsley
The process of linking native riverine woodland habitats found immediately outside Holmsley Inclosure has continued with the clearance of non native conifers from the riverine corridor. Following the clearance of trees, the felling residues were raked up with an excavator and burnt on site. A total of 21.1ha has now been restored.

The incised 'v shaped' river gully upstream of the concrete ford has been re profiled and in-filled using gravel, clay plugs and wooden steps using two 360□ excavators and two tracked dumpers (on external hire). This has slowed down the flow of the stream and raised the level of the stream bed by approximately 450 mm to 600mm. This work helped to support the restoration of the mire at Stoney Moors immediately adjacent to the Inclosure boundary. In order to restore natural processes, side drains were blocked using heather bales to reduce flows into the newly profiled channel. The Inclosure was set to be thrown open to grazing commoning stock but following consultation with stakeholders an entomologist was commissioned to evaluate the grazing options as Holmsley and Wooton Inclosures as both areas contained considerable invertebrate interest.

Wooton Copse
Scattered conifers were removed from an area of Wooton Inclosure adjacent to the riverine woodland with a series of deer exclosure plots erected in order to monitor the response of broadleaved natural regeneration in the absence of deer browsing. A total of 325 metres of fencing was erected. As with Holmsley Inclosure the fence line was retained due to the considerable invertebrate interest.

During 2005, the Forestry Commission engaged an entomological consultant to assess the potential impact of introducing grazing into Holmsley Inclosure and Wootton Coppice in order to maintain the restored mire communities. The consultant's report (see annex 9.6) concluded that the sites supported rare and nationally rare invertebrate species, including Southern damselfly, short-winged conehead, woodland grasshopper, wood cricket, and sallow clearwing. The recommendation was to allow light, seasonal grazing to maintain structural diversity in the habitats, prevent natural succession to scrub/woodland and produce favourable condition, rather than heavy stocking, which could damage the habitats.

Hampshire Avon catchment

Milkham Inclosure
Riverine corridors had prior to this project been cleared of conifers, with the areas raked and burnt, but the Inclosure had not been open to the unobstructed movement of commoning stock and hence grazing of the riverine habitats. Following issues at Holmsley Inclosure that resulted in the retention of a fence line, some 4,620 metres of boundary fencing was removed from Milkham, opening up 158 hectares of the Inclosure to grazing.

This Inclosure is a good example of how the New Forest Wetland Management Plan is already being taken forward through other funding streams. Techniques and knowledge learnt under the Life 3 project are being applied to maintain a mire system and raise bed levels in Linford Brook. These actions were identified in the management plan for the future and are already being actioned.

The total actual cost of action C2.1 was €536,159, compared with an estimated cost of €683,526.

Conclusion
The planned action was achieved, with 183 hectares of riverine/bog woodland restored to unfavourable recovering condition through a range of practical techniques. This total area was comprised of 163 ha of riverine woodland restoration; 10 ha of bog woodland restoration, together with a further 10 ha where suitable conditions were created for the development of additional bog woodland (e.g. following the river restoration in the upper Highland Water, on the Open Forest). The results can be seen on the map in Annex 9.3.

6.2.3 Action C2.2: The restoration of links between pre-Inclosure riverine and bog woodland and nearby networks and stimulate natural succession on the NT land

Target habitats/ species	Riverine woodland and bog woodland
Measurement definition	Area restored via removal of conifers & other exotics; disruption of artificial drainage system; fence removal and re-introduction of livestock grazing
Total area completed	16 ha conifer removal; 4.1 Ha of woodland and 6.6 Ha of mire restored

The land tenure situation here is quite complex, and the works required careful liaison and co-operation between FC and NT foresters/wardens. At Newlands Plantation the total area of restoration work was 16 hectares, of which 4.1 ha of restoration contributed towards re-establishment of riverine and bog woodland, and 6.6 ha towards mire restoration targets. The remaining area is reverting to dry heath. NT wardening staff, assisted by a small team of local contractors, carried out the majority of the work. As a result of internal re-organisation the NT lost their local forestry staff, resulting in much of the woodland work being contracted out. This involved the clearance of lodge pole pine, with both standing and windblown trees removed; including cutting pine from both the stream edge and flood plain of Dockens Water.

These works created a 15 metre riverine corridor on both side of Dockens Water. This area is comprised of native hardwoods and valuable forest lawn. In order to complete the works some areas of seedling pine and birch were also cleared. A large area of birch was also cleared, representing a continuation of the previous bog woodland and mire restoration. This was carried out in conjunction with FC who built a temporary bridge in order to gain access to the site. All works were undertaken with consent agreed by the forest design plan.

The need to reinstate a grazing regime to this area within the life of this project was very important. The NT were successful in working with the FC, Verderers and the CDA to determine the appropriate places for the removal of existing fencing, which was taken down by the FC during January 2006.

This enabled the site to be connected with the extensive grazing regime on the adjacent heathland to the north. The results can be seen on the map in Annex 9.3. Before and after photographs of some of the work can be seen in Annex 9.22.

The total actual cost of action C2.2 was €116,826, compared with an estimated cost of €130,668.

Conclusion
The planned action to remove 16 ha of conifers at Newlands Plantation was achieved, resulting in the restoration of restore 4.1 ha of riverine/bog woodland and 6.6 ha of mire.

6.2.4 Action C3.1: Restoration of periodic inundation patterns in the upper catchments to maintain stream water levels throughout the year on the Crown Lands: Valley mires

Target habitats/ species	Valley mire
Measurement definition	Area of mire restored via tree removal, ditch blocking & restoration of fluvial processes.
Total area completed	184.5 Ha.

By the end of year four, 184.5 ha of valley mires had been restored, of which 34.8 ha were pre-Inclosure mires, located within the Forest Inclosures (C2.1); 6.6 ha were at Newlands plantation (C2.2) and the remaining 143.1 ha were on the open forest (C3.1). Both the mire and wet grassland (lawn) restoration actions have involved considerable consultation via the Forum and additional site specific consultative meetings to try to gain consensus from the commoners, the Verderers and conservation groups. These consultations resulted in delayed actions on the ground with the FC's ecologist investing considerable time in preparing detailed plans and consulting with interested parties. Because of this, progress was slow to build up, with accelerated achievements in the final year of the project.

Typically, many of the mires restored had deteriorated over time through drainage and gully erosion. The subsequent drying of the mires has resulted in the establishment of broadleaved scrub and secondary woodland. The restoration process has addressed the headward erosion, cleared areas of broadleaved scrub and woodland encroachment and raised water levels. Throughout the restoration process it has been essential that the repaired surfaces do not pose any physical threat to commoning stock.
The results can be seen on the map in Annex 9.3. Before and after photographs of some of the work can be seen in Annex 9.22.

River Avon catchment

Broomy Bottom
This mire has deteriorated through time by gullying erosion. To halt and repair the damage being caused to the open forest habitat along the course of this minor stream, heather bale plugs have been inserted in the 'nick' points to act as physical barriers. At the same time some of the invading pine was removed within this locality. A total area of 10.12 ha was restored using this technique between December 2004 - March '05.

Holly Hatch
Work was undertaken by contractors to infill the badly eroded stream flowing from the adjacent mire, and to re-define the drain along the Inclosure bank and stabilise it with timber dams. Heather bales were used to fill in the drain, and clay and gravel were used to raise the stream bed level. A total of 5.02 ha of mire was restored.

Avon Water catchment

Stony Moors
As a result of drainage activities in the early 1940's, mire vegetation communities at this site have experienced substantial decline and subsequent encroachment by willow, birch and alder. The FC has employed local contractors to complete the first phase of work, 2.64 ha of tree clearance was undertaken to restore light levels and to allow access to the wooded areas of the mire for materials and machinery for the subsequent in-filling of drains. Species tackled included birch, willow, alder and occasional pine. Contractors with small scale extraction equipment were engaged during September to extract and cut material off site. All the material that could be extracted was taken off site leaving only the material that could not be reached by machine. This will remain in situ and is likely to rot down in time.

Specialist contractors were then engaged to restore the mire system above the bridge at Stony Moors and the deepened channel downstream of the bridge. The contractor used heather bales along with clay plugs to infill the channel downstream from the nick point of the eroding mire. This involved removing old gabions at the head of the mire and re-profiling the eroded channel. Contractors then built up clay plugs at suitable intervals and filled in the space between them with staked heather bales. The levels were then stepped down to meet the new channel level at the bridge/ford. Downstream from the bridge/ford, the bed levels of the stream were raised by approx 300 mm by building live willow dams and infilling between them with gravel.

Holmsley Bog
This mire supports a range of vegetation types including the rare transition mire community which is only found in a few localities in the New Forest. The flagship species for this community is slender cotton-grass (*Eriophorum gracile*), a nationally rare plant in the UK. It was last recorded at Holmsley Bog in 1968 but has subsequently been lost from this site due to the invasion of willow and alder scrub from the adjacent bog woodland.

The Life 3 works comprised the phased felling (in winter 2004 and 2005) of adjacent compartments of the encroached scrub. Trees were felled and the arising burned to restore the open conditions for the recovery of transition mire. In 2006 any re-growth of willow and alder was treated with a herbicide to ensure the open conditions prevail to allow re-colonisation by mire species. As such 8.05 hectares of mire was restored.

Since restoration works commenced at this site, several plants of slender cotton-grass have been discovered, and it is anticipated that the clearance of trees will allow that species and the associated plant community to become established in this part of the mire system. Upstream of the Life works in Holmsley Bog, a 19th Century drain is still having an adverse effect on mire, wet heath and wet grassland interests. Consultation and discussions regarding the future of this drain are ongoing.

Wilverley Bog
Wilverley Bog is located adjacent to the Avon Water just downstream of Holmsley Bog. It too supports transition mire vegetation as well as stands of ancient bog woodland. During the winter of 2005-06, the Life 3 works focused on the localised removal of willow from formerly open habitats as well as the felling and removal of some encroaching Scots pine. Locally, access tracks were repaired to ensure users remain on these robust routes across adjacent sensitive habitats. These LIFE works have delivered the restoration of 23.1 hectares of mire habitats at Wilverley Bog.

Lymington River Catchment

Slufters Mires
There are 11 tributary mires on the open forest around the periphery of Slufters Inclosure. Each of these has been damaged by headward erosion associated with the artificial drainage channels first dug when the Inclosure was established in the mid-19th Century. On the open forest the Life works sought

to halt the erosion and support the water table in these mires. During the winter of 2004-05 the drains around North Slufters were infilled using staked heather bales, spoil (where available) and clay plugs. More recently, in spring 2006 the remaining two mires adjacent to South Slufters were restored using the same materials and methodology. The result of this open forest work has been to restore and maintain some 28 hectares of mire which is then linked to further mire restoration in Slufters Inclosures (see C2.1).

Bratley Bottom
The majority of the mire habitat in Bratley Bottom was in favourable condition prior to the Life Project. However, in one area adjacent to North Oakley Inclosure the mire habitat was degraded due the mire outflow being channelled into a culvert before being introduced in an Inclosure drain. Following consultation it was agreed that the culvert be removed and replaced by a ford at a substantially higher level. Upstream of the ford the drain was infilled and downstream bed levels were raised accordingly. The result of this life work has been to support the water table in the leading edge of the mire and to slow rates of run-off from this part of the system. Scattered seedling pine were also cleared from the surface of the mire, thereby halting the encroachment of this tree species. The life works have restored 4.6 hectares of mire.

Withybed Bottom
The fabric of this mire had been destabilised by the presence of a narrow bridge crossing which is part of 'Murray's Passage', a well known track in this part of the Forest. The narrow bridge had channelled the outflow from part of the mire and lead to headward erosion with an active nick-point. This erosion was exacerbated by the trampling/poaching by livestock coming down to the mire to drink. Using local contractors the works involved the use of staked heather bales packed tightly into the main channel and adjacent erosion features. The result has been the cessation of erosion, and the heather bales have supported the water table at the leading edge of the mire. By halting this erosion the Life works have restored 15.2 hectares of mire at Withybed Bottom.

White Moor
White Moor comprises a mosaic of mire, bog woodland and wet heath that has been significantly damaged by drainage activities in the 1970's. The drains have suppressed the water table and lead to the loss of some mire and the drying out of an area of bog woodland. In the spring of 2006 the works involved the complete infill of some drains (using staked heather bales and adjacent spoil) and bed level raising in others. This has allowed the water table in the mire and the bog woodland to be raised, and works on peripheral drainage have greatly benefited the wet heath community. As such these activities have restored 1.3 hectares of mire, 0.6 hectares of bog woodland and had the wider benefit of reducing the influence of artificial drainage on 11.4 hectares of wet heath.

Millyford
The restoration proposals for Millyford largely focused on the alluvial grassland interest. However, some of the scrub and secondary woodland encroachment identified for removal as part of that proposal overstood remnant mire and soakway communities. As such the felling of pine, birch, oak and thorn to maintain open conditions restored not only grassland but also local mire communities. In March 2006 some 1.0 hectares of mire was restored at Millyford.

Warwickslade
The majority of the mire at Warwickslade was in favourable condition prior to the Life project. However, maturing and seedling birch had colonised part of the mire and was beginning to shade out the underlying vegetation. The encroaching trees were felled and the arising burned. This action brought about the restoration of 8.9 hectares of mire.

Church Moor
Church Moor has been well studied by local paleo-ecologists and is thought to be one of the oldest mires in the New Forest, estimated to be 7,000 years old. A strip of bog woodland exists in the centre of the mire, but the majority of the mire surface had become colonised by sapling Scots pine which had

seeded in from adjacent mature trees. As such the mire was heavily shaded to the detriment of the communities present. Under Life the FC used a winch system to extract the felled saplings from the delicate mire surface. Once on more robust soils the arisings were burned. The adjacent mature pines were also felled as part of this action to remove this source of future encroachment. This action allowed the restoration of 3.1 hectares of mire habitat.

Red Rise and Creek Bottom
Along Red Rise and Creek Bottom are a series of seepage mires generated by the spring line issuing from the adjacent slope. These mires sit in shallow basins on the slope, their outflows tapering as they flow downstream towards the Ober Water. The majority of these mires have experienced some attempts at artificial drainage in the past, but most have self-healed. However, two mires still had significant drainage channels affecting the habitat. Under Life the outflows of the two mires have been supported using staked heather bale plugs. This has halted any further erosion of the mire and supports the water table at the leading edge and as such has restored the extant mire. Consultation and discussions regarding the future of the drains downstream of the mire are ongoing. In addition to drainage, some of the mire areas had become locally encroached by willow, birch and pine. These were felled as part of the Life works. Locally access tracks were repaired to ensure users remain on these robust routes across adjacent sensitive habitats. The project delivered the restoration of 14.5 hectares of mire habitats at Red Rise & Creek Bottom.

Markway (Duckhole Bog)
Following the past restoration of this mire the Inclosure fence has been removed to enable the unrestricted movement of commoning stock in order that the mire could be grazed. A total of 1524 metres of fence line were removed opening up 64 hectares of Inclosure to commoning stock and securing the restoration of 6.7 hectares of mire.

6.2.5 C3.1.2 Wet grassland ("Lawn") restoration

Target habitats/ species	Alluvial grassland or "lawns"
Measurement definition	Area of habitat restored via scrub removal, disruption to drainage systems, introduction of livestock grazing & restoration of fluvial processes.
Total area completed	141.5 Ha.

Over the last 100 years along the stream corridors, alluvial grassland communities have been colonised by mixed broadleaf woodland and scrub. The Life 3 works have restored areas of grassland where encroachment was most recent. Similar to the mire restoration, the plans have required additional consultation in order to try to gain consensus and ensure stakeholder groups remained committed to the project.

Lymington River catchment

Markway Lawn and Red Rise
The restoration of this lawn was very contentious and had been debated for many years prior to the project. Eroded gravels from higher up the system were being deposited on the lawn, which in time had lead to the main channel becoming blocked. A braided system of channels had developed across the lawn and with it the vegetation had started to change with rushes *Juncus* starting to dominate in some areas. The value of the lawn to commoners was seen to be in threat and access across the lawn by walkers was difficult as a footbridge became dysfunctional.

Restoration of the lawn required all parties to gain a better understanding of the processes involved as it was clear that any works to clear gravel from the blocked channel on the lawn was neither sustainable nor desirable. Restoration of the Ober Water upstream of the lawn was described in section 6.2.1 of this report, this work slowed the water and the amount of material being transported through the system. On Markway Lawn the Geodata survey identified the deepest channel, which was cleared of weed in order to carry the main flow through much of the year, whilst ensuring the braided system was still allowed to function during periods of high flow. The restoration involved the cutting of a short new section of channel.

Early indications are that the restoration is working very well and has addressed a number of long standing concerns from both the environmental and commoning stakeholders. A total of 7.74 ha of lawn was restored during 2005.

Additional work at Markway involved the removal of the inaccessible bridge and the improvement to access to a downstream bridge with the construction of a vented causeway. This will enable people to use the bridge crossing throughout the year and reduce visitor pressure on the surrounding riverine woodland. In addition the amount of scrub and Scots pine regeneration was significantly reduced across the area of the lawn.

Brinken Wood Lawn

The western edge formerly exhibited wet grassland and wet heath, as shown by the 1814 Driver maps. Today these habitats have largely been colonised and encroached by secondary woodland. The restoration of this site has involved felling 6.0 ha of young trees comprising oak, birch, willow and thorn scrub. The residues have been cleared and burnt on site by the contractor. Larger diameter timber was cut into lengths in order to facilitate extraction off the site in the drier summer months. Felling was carried out between December 2004 - March '05, and the timber was extracted in August '05.

Areas of bracken on the lawn next to newly cleared areas were later treated with herbicide in order to reduce vigour of the bracken to encourage the development of lawn habitat. The bracken was treated with 'Asulox' at a rate of 10 litres per hectare. The treatment was carried out as an addition to the programme of open forest works that is carried out yearly by one of the FC tractor units, using an Ultra Low Volume Applicator. A total of 1.4 ha was sprayed during summer 2005.

Allum Green

Contractors completed felling works to clear birch, oak and scrub from the alluvial grassland area. A nick point at the mire system was in-filled with 18 heather bales and oak boards/stakes in order to prevent any more headward erosion. A total area of 11.17 ha was restored.

Sporelake Lawn

This site has suffered encroachment by scrub and recent secondary woodland, leaving small and fragmented areas of lawn. The SAC Management Plan identified that the grassland habitat present is of high priority. Removal of scrub will aid wet grassland communities from being shaded out and allow a more favourable status for the hydrology of the site. All planned felling work has now been completed. Oak, birch, willow and thorn scrub have been cleared and the lop and top burnt on site. A total of 9.24 ha was restored.

Butts Lawn

Fencing, (totalling 742 metres) which was erected at the start of the project to protect a newly restored water course from poaching by livestock, has been recently removed now that the natural vegetation has grown back, in order to maintain the wet grassland. No further fencing was required under Action C3.1 (Lawns), since grazing pressure elsewhere was generally low.

Avon Water catchment

Sheepwash Lawn

Over the last 100 years, alluvial grassland communities along this stream corridor had been almost completely colonised by mixed broadleaf woodland. The Life 3 project restored areas of grassland where encroachment was most recent. FC staff coppiced alder and ash, and cleared back 1.5 ha of encroaching scrub from these discreet areas of grassland. Arisings were cleared as work progressed. The felling work has introduced the physical parameters (reduced water uptake and increased available light) for the grassland vegetation communities to be restored. Since no herbicide treatment was employed on the cut stumps, the recovery of the 'stools' will be monitored. The scrub habitat that develops is of significant ecological value, and will be managed in accordance with the grassland/scrub management prescriptions detailed in the SAC Management Plan.

A total of 141.5 ha of wet grassland has been restored, meeting the project target. The results can be seen on the map in Annex 9.3. Before and after photographs of some of the work can be seen in Annex 9.22.

The total actual cost of action C3.1 was €428,147, compared with an estimated cost of €352,045.

Conclusion
The planned results were completely achieved, with 141 ha of wet grassland habitat restored via scrub removal, disruption to drainage systems, and the introduction of livestock grazing. This, together with the mire restoration total, was a considerable achievement, given the challenges presented by the need to consult with and gain support from the local community.

6.2.6 Action C4.1-4.3: River restoration

Target habitats/ species	River habitats; riverine & bog woodland
Measurement definition	Total length of river restored using various techniques
Total area completed	10 km.

Phase 1 (July-August 2003)
Many parties on the WBMF and in the wider community initially held reservations about the proposed work, largely due to its scale, innovative nature and the sensitivity of the environment. However, the approach taken to river restoration by first completing a demonstration project, and then following up with a more extensive section of restoration, which included a reach on the Open Forest, proved invaluable in terms of winning the confidence of and support from consultees. The demonstration, on the Black Water at Rhinefield, was able to show that the practical river restoration techniques worked successfully, achieving a more natural behaviour in the river, and provided a good opportunity to generate trust and raise awareness among the general public, Commoners and Verderers. A mandatory flood risk assessment was also carried out, although not originally foreseen in the project application.

Once the operations and practical techniques, which had never been tried out before in this large protected area, were shown to work successfully, with minimal impact on the environment, they could then be rolled out more extensively over the following 1 - 1.5 years. 955m of river was restored in year one. This was less than the 3.33 km originally planned to be completed in Phase 1, but this was for reasons explained above, and the target lengths were achieved over the next two years. Further work was undertaken at Rhinefield in 2005 and 2006 (see page 33).

Phase 2 (August-October 2004)
Delays in a start date for Phase 2 were encountered due to DEFRA requesting an Environmental Statement (ES) to be undertaken in March '04, a process which ran for three months but resulted in DEFRA giving the go-ahead to continue with the work. This finally commenced on Friday 13 August, and 3.7 km of the Highland Water had been restored by mid-October when work stopped to avoid disruption to migrating sea trout, which swim up the streams to spawn at that time of year, and the sensitive nature of the soil structure which could have been damaged by operations in wet weather.
A grazing impact report was commissioned by an independent consultant, and formed part of the appendix to the ES (see Year 2 progress report, appendix 4.5). This concluded that the river restoration

would not result in a significant loss of grazing to Commoners' livestock. Further work was undertaken at Highland Water in 2005 and 2006 (see page 32).

Phase 3 (May-October 2005)
Restoration work included the connection of a fourth cut-off meander (the "snail meander") along the Black Water in Rhinefield Inclosure; completion of the section at the downstream end of Highland Water; work within Dames Slough Inclosure; and restoration work at Blackensford Bottom (a total of 4.5km was to be completed in 2005). The bulk of these works were conducted between May - October 2005. Work was scheduled to optimise operational time by working on wetter and more sensitive sites at (typically) drier times of year. Consultation on plans took place with FC and EN, as well as Forum members, representatives from the Commoner's Defence Association (CDA) and Verderers, and the general public. Works started on 9th May at Dames Slough, then moved onto Highland Water, which was completed by 13 June, before moving across to Blackensford Bottom, then on to Rhinefield. In 2006, further remedial works were carried out at Rhinefield, Highland Water, Blackensford and Dames Slough. A site-by-site account of the river restoration is given below:

Dames Slough
Work was carried out on a 1.56 km channelised reach totally within Forest Inclosures, stretching from the Black Water bridge on the A35 at SU 253 047 upstream to Dog Kennel Bridge at SU 240 050. This reach runs primarily through what was fairly deep conifer plantation with some extensively deepened and straightened channels and many spoil heaps clearly in evidence. Reference to the 1870s maps indicated that the channel had been straightened post this period. Site set-up commenced on 9 May 2005, with installation of a mess cabin, office cabin and toilet, machinery brought to site and site signage put in place. A fish rescue was conducted in advance of work starting, together with a walk-through ecological survey, and advice to operators on pollution prevention.

River restoration work started on 11 May, and included the following:
- Re-instatement of original meanders;
- Cutting of new meanders where original channel could not be located;
- Installation of 10m clay plugs to divert flow from drainage channel into new meander;
- Partial back-fill of drainage channel and re-profiling of banks, leaving backwaters and linear ponds where in-fill material was not sufficient;
- Bed-level raising work using locally sourced hoggin where the restored channel occupies the previous drainage channel.

This work resulted in an increase of approximately 549 metres of river length, with a total of 2.109 km restored at this site. After the main bulk of work, further refining was made to river and floodplain profiles to optimise results. Large volumes of spoil were evident at the down-stream end of the Inclosure. These were stock-piled to be moved off-site to other areas targeted for restoration. Approximately 400-500 tonnes of material was moved to Highland Water for the next phase of work.

The work carried out may contribute to the re-establishment of the rare cut grass *Leersia oryzoides,* a priority BAP species. Its extinction is thought to have been brought about through either over-shading, grazing, or re-routing of the channel. Consultation between EA and Neil Sanderson (ecological consultant and WBMF member) sought to secure a suitable restoration design, taking into account its specific habitat requirements, which may help with its re-establishment.

Highland Water
Work began here in 2004, with the remaining 360 metres being undertaken in 2005. Site set-up started on 6th June, and a fish rescue was carried out in advance of works commencing, together with a walk-through ecological survey. This phase of work took 18 days, as planned, with an additional week for minor remedial work to the 2004 restoration, and making good the site. The work carried out was very similar to that at Dames Slough, with the exception of cutting new channels, and in addition, old spoil heaps were removed. Together with remaining quantities of spoil from Dames Slough, this was taken

to Blackensford Bottom, programmed for restoration at the end of June/July 2006. An overall total of 3.970 km of river was restored at this site.

Blackensford Bottom

The majority of this 800 m reach is within Forest Inclosures, stretching from the point at which the Blackensford Brook divides from what goes on to become the Bratley Water at SU 237 065, to where there is further division into Blackensford Bottom and Stinking Edge Wood at SU 230 069. This was a straight, artificial channel through floodplain woodland, with bed levels lower than the adjacent palaeochannel, which was evident primarily on the left bank. The deepened nature of this channelised reach had eroded upstream, beyond the Inclosure boundary where the watercourse bifurcates, and was eroding back into headwater mires on each arm. As a result, further work was also proposed outside of the Inclosures, connecting the river restoration works with mire restoration works done under Life 2. This extended some 350m up each river fork into the Open Forest to SU 228 069 in Blackensford Bottom, and SU 230 070 in Stinking Edge Wood.

Site set-up started on 27 June, with restoration work beginning on 4 July. A fish rescue was conducted in advance of work starting, together with a walk-through ecological survey. Restoration of this reach was completed much faster than initial predictions, due to dry weather, taking 44 days (including site set-up) instead of the predicted 66 days. Works done were very similar to those carried out at Dames Slough and Highland Water, with the addition of the construction of three crossing points within the Inclosure, and two fords and a bridge on the Open Forest.

Remaining quantities of spoil were taken to Rhinefield for use in restoration. Material usage for this section was well below the original estimate. This was partly attributable to the extra supplies of material brought from the large spoil heaps in Dames Slough Inclosure, but also due to the minimal in-fill work required in the lower section.

Particular constraints at Blackensford included managing operations on the Open Forest in order to safeguard Commoning interests, and to minimise ground disturbance. The down-stream section was within an Inclosure, and therefore less politically and ecologically sensitive. Access routes were agreed with FC in advance of work starting in order to minimise the impact. A total of 1.417 km of river was restored at Blackensford.

Black Water (Rhinefield Drive)

Work was undertaken on a 955m channelised reach totally within Forest Inclosures, stretching from Rhinefield Ornamental Drive at SU 267045 upstream to just above the Irish ford at SU 260045. This was one of the most dramatic manifestations of channelisation on the Black Water: a very deep, straightened channel with palaeomeanders clearly on both sides of the channelised reach. Even though there was a considerable amount of spoil available for use in this reach, it was still insufficient to completely in-fill the channelised section. As a consequence, locally sourced clay was imported in consultation with EN and FC. The majority of this stretch was restored in the first phase of work during summer 2003.

However, the down-stream section was left un-restored then, due to the presence of *Lymnaea glabra* (freshwater mud snail). Restoration of this meander could not take place until further robust populations had been identified within the catchment. Once this had been established, restoration of the down-stream meander could be completed, along with a further meander taking the flow under the double culvert bridge. Works were originally scheduled to start in early summer 2006 and last for 12 days.

However, good progress with earlier phases of work led to restoration of this section also being completed during summer 2005, taking approximately 10 days. A fish rescue and a walk-through ecological survey were conducted in advance of works. Site set-up started on 17 August, with work commencing on 18 August. The type of work undertaken was similar to that on previous sites, with the addition of modification to the downstream section to provide an overspill channel and weir during flood. This was necessary as the bridge that is now taking the main flow will not be able to withstand a full flood flow. When that happens both the main channel and the overflow channel will become operational. Hydrometric monitoring equipment was moved further downstream below the new double channel to capture full flow. The additional meander re-connection, plus bed level raising resulted in an additional 1.549 km of restoration at Rhinefield, bringing the total achieved there to 2.5 km.

The 10 km target for river restoration was reached by the end of the 2005 restoration. However, due to the effects of the river during winter 05/06, some remedial works involving snagging and bed-level raising were required during 2006. These were carried out between May and July at Highland Water, Blackensford Bottom, Rhinefield and Dames Slough.

The location of the C4.1-4.3 actions can be seen on the map in Annex 9.3. Before and after photographs of some of the work can be seen in Annex 9.22.

A section of the Dockens Water upstream of Ibsley Common was restored by the Hampshire Wildlife Trust (HWT), using techniques adopted from the Life 3 project. HWT deputy chief executive Clive Chatters said "without the Life 3 project demonstrating how river restoration techniques can be successfully implemented in the New Forest, this project would not have happened".

Conclusion
The river restoration was a tremendous success, with 10 km restored using a variety of techniques, which in turn has supported the re-establishment of the target wetland habitats. Despite some initial reservations, the work has won considerable support and praise, both at local, regional and national levels.

Survey and monitoring of river restoration

Progress on the topographical and hydrometric work was reported in the technical reports for action C4.2 (Appendix 4.7 to year 3 progress report). The topographical work has been digitised and placed on Arcview GIS.

Topographical survey
All restoration reaches were surveyed both before and after restoration. Halcrow Ltd performed the pre - restoration survey, and Environment Agency staff conducted the post - restoration survey. Reaches surveyed post-restoration were Dames Slough, Rhinefield, and Blackensford Bottom on the Black Water, and the headwaters of the Highland Water. Reaches were surveyed using control stations put in place by Halcrow. Cross sections were taken every 25m, or on every meander apex, whichever was the smaller. (See annex 9.17 for further information)

Pre-restoration data
Information from the topographical data was used to inform the design and operational aspects of the river restoration, specifically:

- Levels for the newly re-instated river course
- Volumes of material required
- Implications for flood management and associated site-specific modelling work
- Guide operations in terms of determining new channel depth & bed gradient
- Produce design drawings and maps used for operations.

Post-restoration information was used to:

- Indicate the river planform after completion of works

– Through digitisation, provide new river planform maps for use with ArcGIS.

Hydrological and geomorphological monitoring
This was carried out throughout the project's duration by two post-graduate students (Duncan Kitts and Catherine Millington) from the Geography Department at Southampton University, under the supervision of Dr David Sear. The final survey report from Southampton University (see annex 9.16) details the methods and results of the three year monitoring programme, which centred around the restoration of river channels and floodplains in the New Forest SSSI/SAC. The results include details of the geomorphological, hydrological and hydraulic processes and characteristics of the Highland Water and Black Water study catchments. In addition, the report details some of the specific characteristics of floodplain forest within this specific ecosystem.

Comments are made on the nature of monitoring restoration projects, and new methods for undertaking monitoring of wooded channel and floodplain habitats are presented. The results broadly show that the restoration has had detectable impacts across the hierarchical scales of riverine ecology from catchment to feature and patch. However, the precise nature of the impact varies in its expression with scale. Hydrological impacts are detectable at catchment scale, but some morphological changes are no larger than natural background variability.

Specific results of the restoration monitoring are:

1) From a hydrological perspective the restoration has been a success. Objectives set at the beginning of the project have been met and the monitoring has shown this and is presented in this report. In particular, the data show that the restoration has had no negative affects on downstream flooding. Rather it has increased retention of flood water within the catchment.

2) The restoration has modified in-channel habitats relative to the channelised condition primarily by providing more pool habitat while reducing riffle habitat. The effectiveness of the restoration in reproducing semi-natural channel morphology is variable between restoration treatments, but generally has not yet attained the same frequency of habitats.

3) The restoration has met the objective of increasing floodplain connectivity and restoring geomorphic processes on the floodplain characteristic of semi-natural reaches.

4) Further restoration of channelised reaches should seek to re-occupy old channels in order to exceed wet woodland targets. Woody debris within these re-occupied or re-created channels is a key part of the process of floodplain connectivity and aids retention of wood and sediment within the river system.

5) Fine sediment loads have increased downstream of the restoration works, particularly associated with the import of bed material used in raising bed elevations. Noting that the subsequent year was unusually dry, these loads fell but remained higher than those prior to the restoration.

This monitoring programme represents one of the most comprehensive such programmes ever undertaken on a river restoration project. Best practice features of the monitoring programme included:

- the extensive and relatively long-term nature of baseline data
- the hierarchical scale at which many of the variables have been measured;
- the integrated measurements of morphology, hydrology, hydraulics and processes;
- the wide range of variables measured over the period of the restoration;
- the clear statement of monitoring objectives and targets linked explicitly to specific measurements.

Southampton University Report Conclusions

The monitoring project has been among the most comprehensive undertaken on a river restoration project within the UK. The report presented only the physical habitat and hydrological components. Accompanying reports detailed the ecological response of the streams to the river restoration.
It is important to recognise that the report detailed only the initial impacts of the restoration. In the case of the Black Water/Blackensford, this effectively amounted to the as-built conditions, whilst on the Rhinefield and Highland Water sites this extended to 1.5 years after restoration, though in both cases some remedial activity was undertaken during this period.

The specific results of this study have demonstrated the application of a BACI methodology to physical process and form. The approach enables change to be put into context, and the affects of the restoration to be determined relative to natural variability, and to reference conditions within the study stream. Similarly, the application of a hierarchical approach to monitoring change, has enabled the reach-scale restoration affects to be contextualised. Moreover, it has proved possible to detect restoration affects across all scales, ranging from patch-scale sedimentation and erosion of the floodplain surface, up to catchment scale affects on flood routing, floodplain and in-channel morphology.

As a result the following conclusions can be stated:

1) At the catchment scale the restoration effect on channel habitat features as measured in this survey are not detectable above background variability. When compared to the change that would be expected without restoration, there is a measurable catchment scale effect, though this varies between catchments. Within the Highland Water the restoration supports the same frequency of features as one would expect under semi-natural conditions. Within the Black Water, the restoration has resulted in fewer features than expected under semi-natural conditions at the catchment scale.

2) At the reach-scale the restoration has had measurable impacts on the in-channel habitat compared to natural variability. Specifically, riffle, pool and debris dam frequency is higher than would be expected due to natural variability. However, in most cases the restored re-meandered reaches remain impoverished in such features relative to semi-natural references.

3) In the Highland Water study reach, reach-scale long profile morphology has been altered by the restoration to include more residual pool habitat. This trend is confirmed relative to a control reach. Of this pool habitat, backwater ponded pools created upstream of active debris dams within the restored reach account for 45% of the residual pool habitat.

4) In the Highland Water re-meandered study reach, the restoration has resulted in the formation of a finer bed substrate relative to a semi-natural control reach. In contrast, the reintroduction of debris dams into a channelised reach has not resulted in significant fine sediment accumulation.

5) The re-occupation and re-meandering of the river has led to increased floodplain connectivity as measured in terms of the frequency, duration and area of over bank flooding

6) The introduction of Large Woody Debris (LWD) into channelised reaches has not substantially affected the channel morphology, sediment transport processes or floodplain connectivity. It has increased woody debris residence time and this may represent a process that will lead to further changes in channel morphology and flood inundation.

7) The re-meandering and LWD input has resulted in an increase in the time it takes floods to travel downstream by up to 40 minutes. This increase is larger than that resulting from dynamics of LWD alone. As discharges increase, this affect declines, but the extent to which larger floods are affected

remain uncertain. There is evidence of flood attenuation. Thus the restoration has had a net positive impact on downstream flood risk.

8) The restoration has re-established geomorphic processes characteristic of semi-natural reaches. These include re-activation of floodplain channels, spatially variable erosion and deposition on the floodplain surface, and the movement of woody debris.

9) Analysis of the trapping efficiency of different floodplain surfaces indicates that short cropped grasses are more likely to trap fine suspended sediment and eroded floodplain material compared with long grasses. Changes in vegetation cover will therefore influence sedimentation patterns and storage on the floodplain.

10) On the Highland Water, the restoration increased suspended sediment concentrations by approx. 900% at the restored site during the first winter following the restoration. It is suspected that suspended sediment concentrations also increased downstream at the RSDD site, although the amount by which they increased cannot be quantified due to the poor calibration of the RSDD year 1 data. The research has also demonstrated that during the second winter after restoration, suspended sediment concentrations fell, but not quite back to pre-restoration levels, suggesting that the system is rapidly recovering from the disturbance caused by the restoration but has not yet fully recovered.

11) The restoration has reduced the movement of coarse gravel in re-meandered reaches, but not in the channelised reach with LWD replacement. The addition of gravels in reaches where bed levels were raised, has resulted in higher gravel transport. The net effect is to alter the reach-scale patterns of sediment supply, transport and storage.

12) The restoration has increased the residence time of LWD by creating more opportunities for LWD trapping and storage. A retention index has been developed that could be applied to other streams as a basis for determining the need for restoration.

13) The impacts of the restoration are reach specific. Overall, re-occupation of old channels leads to smaller than natural channel capacity, increased shallow pool habitat, and where active debris dams are present, higher proportions of ponded backwater pools. Habitat diversity is increased relative to channelised reaches, but is generally less diverse than semi-natural analogues. Geomorphic and hydrological processes are restored to the floodplain. In contrast, replacement of LWD in channelised reaches does not appear to have much impact on channel morphology or flood hydrology. It does increase woody debris residence times, and hence may with time influence morphology and reach hydraulics, however debris dynamics suggest any changes will be short lived.

See annex 9.16 for further information.

Hydrological survey – summary from 2006 report
Analysis was undertaken of the stage (water level) data and spot flow data obtained from the hydrometric monitoring network set up in each catchment. Seven sites were installed in the catchment, three of which were installed to obtain a "before" picture, and four were installed later to assess the extent of the impact of the restoration. Comparison between pre- & post- restoration peak events and Low Flows was used to assess the difference the restoration work has had on the catchments.

The main observations from the data were:

- Highland Water 1 data does not show any change in magnitudes of peak events, instead it shows an increase in base flow. This could possibly be due to restoration works since the works raised the site's riverbed and this may have re-connected the stream with the water table in its surrounding wetland. However, there is currently not enough data to support this suggestion.
- Black Water 2 data shows that, post-restoration, there is a decrease in the magnitude of peak event, a decrease in summer low flows and a shift in flow so that at the same stage post-restoration there is less flow. This all suggests that the capacity of the channel is less and that over-banking may be

occurring, which is a desired effect of the restoration. However, the changes in low flow and in gauged flow are reflected in the data of the Black Water 1 control site. This suggests that it might be other external factors, such as climate that are affecting the changes not the restoration. Nevertheless, the change in magnitude of peak events only appears to happen in the Black Water 2 site so this may indicate an effect of the works.

- There was no change in either catchment in time to peak of peak events. This would suggest that the restoration work has had limited success since the slowing down of time to peak is a desired effect of the works.

See annex 9.18 for further information.

The actual cost of the C4.1 – 4.3 actions was €1,136,797, compared with an estimated cost of €1,537,254.

6.3. Recurring biotope management

6.3.1. Action D2.1 Restoration of riverine woodland programme to coppice streamside habitats along the Dockens Water

Target habitats/ species	Riverine woodland & bog woodland
Measurement definition	Length of bankside trees coppiced
Total area completed	1 km (2.8 ha)

The removal of bankside pine and birch, together with the coppicing of 50 metre sections of mature willow, was undertaken annually by National Trust staff during February-March. A work plan for the coppicing at Dockens Water was prepared by NT (see Appendix 4.17 of year 2 progress report). Work on the coppicing of bankside trees is complete and the target amount (1 ha) had been met by March 2006. This has reduced shading of the river by bankside trees and will benefit aquatic vegetation, invertebrates and Salmonid fish.

The results of Action D2.1 can be seen on the map in Annex 9.3. Before and after photographs of some of the work can be seen in Annex 9.22.

The actual cost of the D2.1 action was €20,261, compared with an estimated cost of €21,764.

Conclusion
The target has now been exceeded, with over 1 km of coppicing carried out, leading to the restoration of 2.8 ha in total area.

6.4. Dissemination activities and deliverables

6.4.1. Action E1.1 – E 1.5 Co-ordinating Project Communications

At the start of the project a Communications Strategy was created as part of the project handbook. This set out overall objectives and guidance for the project's communication activity. It outlined communication objectives, methods and tools to be used, key messages and audiences. From the start of 2004, following completion of several major communications actions outlined in the Partnership Agreement, an annual action plan was created, listing specific goals for the communications team to achieve, maintaining momentum and ensuring an unified direction (See Year 2 progress report, appendix 4.7 & 4.12). This was successful in ensuring that actions were achieved on time, and resources were properly allocated.

The presence of a Communications Co-ordinator proved invaluable, enabling a Communications Team to be set up and led, and ensuring a co-ordinated approach to dissemination, resulting in a bigger impact. Notable successes have been the website (the main pages of which have been translated into French and German), the newsletter and a good number of press releases and articles, together with coverage on local and national TV and radio.

Three Communications Team meetings were held each year, and the Co-ordinator also reported back to the Project Management Team meetings on behalf of the Communications Team. The last meeting was held on 24 April 2006. Copies of the agendas and minutes of the meetings are found in Annex 9.7 of this report..

In addition to completing actions outlined in the bid, the Partnership has also reacted to opportunities to promote and explain the work of the project. This has included TV and radio interviews, hosting talks and tours for a range of audiences. These included local New Forest organisations; partners' own organisations and contacts; academic institutions; European visitors, such as the Czech Ministry of Environment; and the External Monitoring Teams - Ecosystems and Astrale-HTSPE Ltd.

There was discussion at the first Communications Team meeting as to whether the Communications Co-ordinator should be responsible for producing all press releases, specifically on behalf of the Forestry Commission who employ an external writer to work on all releases. It was decided that Partners would be better placed to write their own, but these should be supplied to the Communications Co-ordinator before release, to ensure continuity and that project guidelines were followed.

Although the New Forest's role within the Natura 2000 network had been publicised in both the project leaflet and dedicated pages on the website, there was uncertainly on the best way to incite local interest in the network and its objectives. The recent LIFE-Nature document 'Communicating to the stakeholders and the general public – best practice examples for Natura 2000', (in which the project was actually used as a case study) gave clear guidance and suggested some innovative examples as to how we might widen the promotion of Natura 2000 within the New Forest. Following on, the Natura 2000 logo was added to communication templates (e.g. letter heads, posters, signs, presentations) and a section was added to the website. In addition, a project calendar was produced in 2005, resulting from ideas given in the above publication.

During the project's lifetime, two of the partners' logos were changed (EA and FC). As a result, all communications material featuring the partners' logos has been updated. Two editions of a Project Photo Library were produced, the first covering the period July 2002 - April 2004, comprised of an index in MS Word, a CD containing the photos, and jpeg contact sheets showing thumbnails of the photos. A second edition, covering the remaining period (May 2004 -July 06), is included on a CD in Annex 9.22 of the Final report.

An entry for the Eurosite Awards 2006 was submitted in August 2005, although unfortunately the application was unsuccessful. The project now has its own page on a European nature management website called 'Eurosite' (www.eurosite-nature.org) and has become part of the Natura Networking Initiative (NNI). An entry for the CIWEM/RSPB Living Wetlands Award 2006 was submitted in November '05 by the partnership, including a ten page summary report with supporting photographs. The judges were very impressed with the river restoration and its importance in the context of the Water Framework Directive, but unfortunately the Life 3 project was unsuccessful in winning the award.

The actual cost of the E1.1 – 1.5 actions was €98,295, compared with an estimated cost of €96,299.

6.4.2. Action E2.1 – 2.5: Events and community interaction

Throughout the project, numerous events were organised and run by project partners. These are listed in Annex 9.8. Forestry Commission events are listed in Annex 9.10, including numbers of attendees. Some of the main events are listed below.

Events, and Public Walks

- A launch event was held in December 2002, featuring a "project jigsaw." Photos of this have been used by the EC in its communications publications.

- A public launch event was held at Rhinefield in July 2003. Approximately 100 people attended the two - day event, which featured displays and information, together with regular guided walks along the Black Water, led by partner staff.

- The first end of project celebratory event was held on 2 June 2006 at the New Park Manor Hotel, Brockenhurst. It was attended by 52 invited guests, and partners were represented at a very high level i.e. Chairman or Chief Executive level. A project summary and folder were produced for the guests. An afternoon public event was held at Rhinefield Drive, featuring a talk by TV wildlife presenter Chris Packham, activities for children including willow weaving and pond-dipping, and was attended by around 200 people. Further details are included in Annex 9.9.

- During 13, 14 June '06 a two-day technical conference was held along the theme of "Wetland Management at a Catchment Scale". This very successful event included workshops, presentations and site visits. The organisation of this was led by HCC with input from all partners. It was attended by 65 delegates and 20 speakers, including visitors from Ireland, Italy and The Netherlands. A conference pack was produced for delegates, including a project summary, with a CD containing project publications and documents e.g. the project handbook and the Wetland Management Plan. Further details are included in Annex 9.9.

- Feedback included the following comments: "I found the whole LIFE3 New Forest conference to be exceptionally well organised, the venue was outstanding, and the field visits were extremely informative and inspiring. I was particularly impressed with how "joined-up" everyone involved with the LIFE project was – i.e. it was hard to tell which organisation each speaker and "tour guide" worked for because they were all speaking the same language with a high degree of multi-disciplinary expertise."

Presentations

Numerous presentations were prepared and given by project staff, including the following:

- A public slide show 'The meaning of Life3' took place on 27th January 2005 in Lyndhurst. Presentations were made by Simon Weymouth (FC) and Maxine Elliott (EA) and fifteen people attended this event.

- FC gave a Powerpoint presentation to the visiting Sussex Floodplain Forests Forum in February '05.

- Maxine Elliott (EA), presented a poster on the project's river restoration works at the UK's River Restoration Centre's annual conferences in 2003, 2004 and 2005, attended by approximately 200 people.

- A presentation was given by Tim Holzer (EA Biodiversity Officer) at the RRC annual conference in 2004 entitled "Catchment Scale River Restoration".

- A presentation given by Amanda Craig (EN) at the European Nature Conference in the Netherlands during September 2005.

- On 25 November '05 Jonathan Mycock (HCC) gave a presentation to visiting students from the University of Caen.

- A presentation was given by Doug England (NT) to final year degree students at Sparsholt College, Hampshire, in February 2006.

- On 27 April '06 Jonathan Mycock gave a presentation on managing partnerships at the River Restoration Centre's annual networking conference in Edinburgh

- On 1 June '06 Bryan Boult (HCC) gave a presentation on the New Forest Life projects at Greenweek

2006 presentations are contained on CD in Annex 9.7.

Educational visits

- On 8th March '05 a site visit was led by Maxine Elliott (EA) to Highland Water with students from Sparsholt college in the morning, and the EA's Water Resources Policy Team in the afternoon.

- In June '05, HCC and EA led a site visit for 'A' Level Geography Teachers, which was well received by the teachers who attended, and a useful way of informing the education sector about the project.

- Maxine Elliott (EA Project Manager) & Bethan Davies (EA Hydrometric Officer) gave a presentation and conducted a site visit and flow monitoring work with students from Taunton's College, Southampton during 2006.

- On 11 May 2006, EA, FC and HCC led a guided walk for the Hants branch of the Women's Institute (WI), along the Highland Water looking at river restoration. 51 members of the WI attended the event

- On 27 July '06 Maxine Elliott (Environment Agency) led a guided walk for members of The Ramblers
- In September '06 ME hosted a visit from the mid-Cornwall Moors Life project

Media

- In December 2004 a news item about the RSPB breeding wader survey was shown on BBC South Today. This included interviews with project staff – Carrie Temple (RSPB) and Jonathan Mycock (HCC) at Denny Bog. The wader survey also received coverage on BBC Radio Solent news.

- Meridian TV, in response to an FC press release, interviewed Simon Weymouth (FC), Tim Holzer (EA) and Amanda Craig (EN), and filmed river restoration work in Highland Water, before - works at Blackensford and post - works at Black Water. This was broadcast in January 2005 on Meridian Evening News.

- Tim Holzer appeared in a BBC1 series looking at the Natural History of the British Isles, along with presenter Chris Packham

- Dr David Sear was interviewed on BBC Radio 4 discussing river restoration in the New Forest, and the role of debris dams.

- Simon Weymouth (FC) featured in a Meridian television programme called 'In the Forest' shown in the Autumn, where he was interviewed by Phillippa Forrester about the LIFE3 project.

The actual cost of the E2.1 – 2.5 actions was €86,544, compared with an estimated cost of €81,144.

6.4.3. Action E 3: Project publications: the project journal, the layman's report, news releases and leaflets

- The project journal was an informative public bi-annual newsletter, reporting on the project's aims, achievements, planned public events and sources of further information. Since the structure and content of the Project Journal was undefined in the project application, the communications team decided that it should take the form of a newsletter style publication, giving updates on project progress and informing readers on forthcoming dissemination events. The budgetary allocation has enabled six issues to be produced, starting in 2003, keeping target audiences more regularly informed.

- Newsletters were distributed to project staff, WMBF members, New Forest Parish Councils, Hampshire County Councillors, the New Forest Committee, other New Forest user groups, agricultural colleges, local media, Hampshire Libraries, Local Information Points and the European Commission. The latest issues are found in Annex 9.7.

- A LIFE 3 calendar was produced covering the final two year period (2005-2006) of the project. This promoted the work of the project and its links within the Natura 2000 Network. 500 copies were printed and distributed to project contacts, including WBMF members.

- Early in 2005 a booklet on "woody debris in streams" was published by the Staffordshire Wildlife Trust. This featured the Life 3 project as a case study, and included photographs of the river Black Water.

- The Communications Team submitted text and illustrations, in June, for a poster at the European Nature Conference 2005 to be held in the Netherlands in September. The project was represented by 2 members of project staff at the conference in the Ecological Networks workshop session.

- In summer 2005 the RSPB published a leaflet – 'Guide to waders in the New Forest', which was produced in time for the New Forest Show in late July.

- The EA produced some informative exhibition panels for the River Restoration Centre Conference in April which were also used at the Countryside Event Exhibition in the Royal Victoria Country Park in May.

- The Layman's report (project summary) was designed and printed during September-November 2006 (see Annex 9.11).

News releases published
The Communications Team was successful in producing regular news releases and articles for publication. Some of the highlights are listed below:

- RSPB press release, 14th December 2004 - **'Major new report says New Forest more important than ever for rare wetland birds'** – survey undertaken by the RSPB as part of the Life3 project was completed and the results were summarized in a press release

- FC press release (16 Feb '05) - **''Natural Traction' Extraction Attraction'** – the extraction of timber using horses at a LIFE 3 riverine woodland restoration site. This story received considerable media coverage, including: local BBC news, Lymington Times (2 weeks running), Bournemouth Echo, Southampton Echo, Radio Solent, Radio 4's Farming Today.

- FC Press Release (18th February 2005) – **'Natural Alternative**' - the use of heather bales in the restoration of valley mires.

- *Gee Gee Whiz!* – FC press release to promote the second horse logging event at Wootton Bridge on 6 August 2005.

- *Ten thousand metres of sensitive New Forest rivers restored* – press release sent out by EA on 17 October 2005

Articles published

- RSPB article on wader survey published in Hampshire Bird Report (2004)

- HCC **'Life3 Project Update'** – general project update, *Environment Strategy Group* newsletter, Feb 2005.

- FC **'simple sedge spells success'** – about the reappearance of slender cotton grass, and information on the progress of the project through FC work, plus a sub-article **'a long life on show'**, *Forest Focus*, March 2005.

- EN **'back to their routes'** – information on the importance and benefits of the Life3 project, *Envisage Issue 11*, April 2005

- *Heavy horses make light work of haulage* – an article in EN's 'Sitelines' magazine in October 2005.

- *Return of the Natural Rivers* – an article in an independent on-line magazine that is promoting the New Forest National Park in November 2005.

- *A New Life* – article in Forestry Commission's Forest Focus magazine, April '06

- 'Regional Director's visit to Life 3 site' – an article in Environment Agency's 'Grassroots' Southern Region staff newsletter, Feb '06

- LIFE continues to build partnerships in the New Forest National Park – article in EC publication 'LIFE in Europe's Forests, March 2006.

- GeogNews: Postgraduate Cath Millington inspects stream excavation on the New Forest EU-LIFE3 project –Southampton University: School of Geography; Issue 28; June 2006

- '£2.9 m re-bogging of Forest now complete' – Lymington Times, 10 June 2006

Project film (Annex 9.23)

FC commissioned the making of a film which will be used to promote the project. It was made over 12 months between April 05 – May '06, and was ready for the end of project event and the New Forest Show in June/July 2006. Local film maker Dr Manuel Hinge produced the film, which was put on to DVD format, which can be used by schools and colleges. It covered all aspects of the project from the works on the ground to the role of the WBMF and public education and communications and will promote the aims and achievements of the project. One hundred DVDs were produced for dissemination to partner organisations, interested groups and local schools. The DVD has been shown internally within Environment Agency and HCC at staff meetings. It was also shown to hundreds of visitors to the New Forest Show, on the Forestry Commission stand during 25-27 July '06. Copies were produced in MPEG format for the Commission and project partners, to enable the film to be linked to their respective websites. Further details of dissemination/publicity work can be found in Annex 9.8.

The actual cost of the E3.1 – 3.5 actions was €41,869, compared with an estimated cost of €42,091.

6.4.4. Action E4.1 – 4.5: Project website

- One of the key aspects of the project's communications has been the website. This has acted as the cornerstone of the communication strategy, and all other outputs of the project have been linked to it. The sophisticated website was designed by a member of staff who was previously a freelance website designer.

- Additions to the website have included; events, press releases, newsletters, the Breeding Wader Survey, Progress Reports, Interim Report, Fencing Proposals report, river restoration report, and Final Report. Minutes and agendas for various meetings were also posted on the partners' intranet pages.

- There have been a steady increase in the number of visits to the website and the total number of visitors to the end of October 2006 was 10,689. The website has been publicised in newsletters and news releases.

- A 'Frequently Asked Questions' page has been updated to include new information on the recently designated New Forest National Park. The 'Project Update' page was revised in 2006, including before and after photos and details of the end of project events held in June.

- The website text has been changed into the past tense now that the project has come to an end. In addition, the executive summary, the results section, and the end of project events section have been translated into French and German.

- It is intended that the future maintenance of the website will be taken on by the New Forest National Park Authority at the end of 2006.

The actual cost of the E4.1 – 4.5 actions was €9,805, compared with an estimated cost of €17,577.

6.4.5. Action E 5.1 – 5.3: On-site interpretation and temporary operation signs

- EA, FC and NT have produced on-site signs when practical work has been carried out. These have been sent to HCC's Communications Co-ordinator for approval beforehand.
- Signs were put up at the Highland Water site during construction work. An interpretation board (produced in consultation with FC and HCC) was also positioned at the site, explaining the New Forest LIFE 3 project work.
- EA produced two detailed interpretation boards which were installed on site at Black Water and Dames Slough by FC. Details of these were included in the year three progress report.
- FC had 100 LIFE 3 signs produced which were be erected on works site describing each of the four habitats and what was being done under the LIFE 3 project to restore them.
- NT produced and displayed temporary work signs. These signs were sited both directly on site and around the local area. The signs explained the works being undertaken and helped to promote the project as a whole through the use of logos

The actual cost of the E5.1 – 5.3 actions was €6,907, compared with an estimated cost of €14,668.

6.5. Overall project management

6.5.1. Action F1.1 (HCC, supported by partners)

During the first six months of the project, partnership agreements were prepared by HCC, agreed with and signed by all partners. The agreements were between HCC as beneficiary, and each partner, ensuring that partners accepted responsibility for their actions within the project and for their obligations and duties as defined by the SAP. A comprehensive Project Handbook was prepared during October 2002 and served to guide how HCC managed the project partnership (see Appendix 4.12 of Year 1 progress report). The handbook was based on the LIFE 2 project handbook, but developed further, for example, to include a communication strategy. The handbook formed part of the Partnership Agreements. Microsoft Project was used by HCC and by the Environment Agency to assist with delivering the project.

Section 5 of this Final Report includes an organigram, showing the project management structure, membership of the Project Management Team, and its relationship with the EC and the WBMF. Project Management Team meetings were held on a four-monthly basis, beginning in October 2002 (see 5.1). During these, there was also feedback from the Communications Team via the communications co-ordinator. The PMT meetings were organised by the HCC project manager and admin support officer, and chaired by the HCC contract manager.

Four-monthly reports were submitted by partners to HCC, comprising a technical report and a financial claim, both with supporting information. Copies of recent technical reports are found in Annex 9.13. These allowed the HCC management team to monitor partner progress and spend. Regular liaison was held between HCC project managers and finance officers over grant claims and variances. HCC finance staff also gave considerable advice and assistance to partners in connection with their four-monthly grant claims from HCC, including visits to their offices to carry out financial health checks. Phased spend plans for each partner were prepared by HCC's devolved finance unit. A workshop was held in October '03 to train partners in using a system devised by HCC for submitting and managing variances, with a follow-up meeting in December.

EA set up a Project Board to discuss the project's direction, and a Project Team charged with delivery of various components. In addition to these, other groups were set up as appropriate (eg Flood Impact Assessment group, Design group).

On 3-4 July 2003 a visit was organised for the UK LIFE-Nature project monitor Ecosystems Ltd. Kerstin Sundseth and John Houston spent an informative two days with the project and met all partners during a combination of indoor presentations and site visits. A further visit to the project was organised for Joaquim Capitao of the European Commission's Nature and Biodiversity Unit and John Houston during 4-5 May 2004. This also combined indoor presentations and discussion with site visits, accompanied by all project partners.

In 2005 a new EMT took over – Astrale – HTSPE Ltd. A visit made by both incoming and outgoing teams, together with desk officer John Stuebler, during August '05.

Three Project Management Team meetings were held during 2005, on 2 February, 9 June and 5 October 2005. Agendas and minutes of the meetings were included in Appendix 4.6. of the Year 3 progress report. The meetings generally had full attendance by all partners. The first two meetings were held at HCC, with the third hosted by FC in Lyndhurst. This was in order to give partners unfamiliar with the work on the ground an opportunity to visit a selection of sites in the afternoon following the PMT meeting.

Regular liaison was held between HCC project managers and finance officers over grant claims and variances. HCC finance staff also gave considerable advice and assistance to partners in connection with their four-monthly grant claims from HCC, including visits to EA, FC and NT over the last year.

Phased spend plans for each partner were prepared by HCC's devolved finance unit. A large piece of work during 2004/05 was the preparation of the Interim Report and SOE, which were forwarded to the Commission on 28 February '05.

During the summer of '05 a large effort was made by all partners to prepare a submission for a substantial financial modification, although this was later withdrawn. A visit was also organised and hosted (by HCC and partners) for a new LIFE desk officer, John Stuebler, together with both the outgoing and incoming External Monitoring Teams (Ecosystems and Astrale respectively).

Following comments on the Interim report received during and after the July 05 monitoring visit, a revised Interim report and SOE was prepared and submitted on 29 September 05. The Interim payment was received in December '05. Preparation of the third progress report was delayed until late 2005/early '06, upon the advice of Astrale. The report was submitted to the Commission in February '06, and comments/feedback were received in late March '06. Further detailed information quantifying practical actions and on monitoring was forwarded in early May '06.

By the time of the May PMT meeting, financial monitoring was showing that the project was heading for an under-spend in the budget. HCC wrote to inform the Commission of this in early August, stating their suggested intention of continuing to keep to the originally foreseen budget, rather than apply for a Request for an Additional Clause (modification). This was because the project did not have long to run until the end, and since exchange rate fluctuations meant that it was difficult to predict with certainty what the final under-spend might be. The Commission agreed with this approach.

Three Project Management Team meetings were held during 2006, on 1 February, 25 May and 4 October. Agendas and minutes of the meetings are included in Annex 9.12 of this report. The meetings generally had full attendance by all partners.

Partner organisations also held their own internal Life 3 team meetings, together with meetings between partners when necessary, e.g. to co-ordinate practical work. The FC delivery team together with the EA have met formally on three occasions in the reporting period to plan forthcoming operations and to review progress. In addition, weekly site meetings were held.

Inventories of durable goods (equipment) were produced by each partner where relevant, and all partners have given a written undertaking for the durable goods to be used for nature conservation purposes beyond the life of the project.

F 1.2: The EA project manager attended EA Board meetings in January, April and July 2005. FC held two team meetings in the period, on 1 December 2004 and 20 January 2005. In attendance from FC were the Project Manager, Ecologist, Communications Manager and Foresters, together with the Project Manager of EA. EA outlined their work plans for the coming year. FC updated the team with work progress and events. A copy of the minutes of these meetings is attached.

F1.4: FC did not appoint a full-time project manager, as originally outlined the application, deciding instead to use existing FO3 forester staff, supported by a full-time ecologist. In their view this represented a more effective use of staff resources. An operating instruction booklet for FC's Life 3 database was written and further improvements were made to the budget reports to show total expenditure for each action against budget in Sterling. FC recorded the areas worked for individual project actions and monitored areas achieved through a Measurable Outputs Report. FC's database proved to be an effective tool in monitoring progress against targets and the associated actual costs associated with the tasks.

The actual cost of the F1.1 – 1.6 actions was €799,842, compared with an estimated cost of €825,294.

6.5.2. Ecological monitoring and surveys

Action F2.1: Ecological monitoring of the aquatic environment (EA)
Macro-invertebrate surveys (see Annex 9.19)

An initial macro-invertebrate baseline survey was carried out on the Black Water at Rhinefield during summer 2003, and this was forwarded with the Year 2 progress Report. Multivariate analysis of the invertebrate community structure was helpful in demonstrating that there were real differences between the fauna of channelised and sinuous reaches. Defining these community differences was less straightforward. Traditional measures of community structure such as diversity and evenness did not, on their own, account for the difference in community structure identified by multivariate analysis, although communities from sinuous reaches were on average more diverse.

Channelised reaches of rivers very often possess the same range of substrates that are present in natural reaches and, at some point in the channel, the specific requirements of most species will be met. Duvel (1976) found that benthic communities were 'markedly similar in their generic composition at natural and channelised reaches'. This was explained by the existence of suitable substratum and benthic habitat in both natural and channelised reaches. However, species richness on the Highland Water was found to be more than three times as high, and on the Black Water, four times as high as that observed in Duvel's study. A diverse fauna is likely to contain more specialists, which in turn improves its sensitivity as a barometer of habitat change. In this study PRIMER has demonstrated that it is able to detect and define such differences, and has proved to be a more powerful tool than simpler measures of community structure.

Multivariate analysis demonstrated that:

- Statistically real differences existed between the invertebrate communities of channelised and sinuous reaches, both on the Highland Water and the Black Water.

- The presence or absence of certain taxa, as well as their relative abundance, defined community change that had resulted from channelisation of the Lymington headwaters.

- Differences between invertebrate communities of channelised reaches and of reference or sinuous reaches demonstrated that SAC habitat was currently in unfavourable condition.

- Restoration that results in increased heterogeneity within the channel will lead to the recovery of a more natural invertebrate community structure.

Key Taxonomic Indicators of Habitat Condition
Some species have been identified that show a high degree of fidelity to, or preference for, one or other of the channel conditions. This allows future abundance data for key taxa to be used in the assessment of habitat quality that relates to sinuosity, provided that follow-up surveys are carried out at the same time of year as baseline surveys.

The majority of efficient, or sympatric, indicators (almost all individuals present in one group, occupying all sites in that group) were for sinuous reaches, although one species (*Silo pallipes*) was a good indicator of channelised, or 'degraded', reaches.

- Restoration will result in community change characterised by increases in some key taxa and decreases in others.

- Future assessment of habitat condition can, to some extent, make special reference to key taxa, or defined groups of taxa, identified as being good indicators of sinuosity.

Conservation Value
The diverse invertebrate fauna present at both sinuous and channelised sites resulted in high conservation scores from the main channel of the Black Water and Highland Water. Generally there were few species of 'rarity value' in the main channel of either river. The conservation value of the macro-invertebrate fauna did not differ between channelised and sinuous reaches.

The diverse array of marginal habitat adjacent to the main river supported invertebrate communities of very high conservation value. In general, marginal habitat was more diverse and abundant in the channelised reaches surveyed in this study, primarily because much of it consisted of the original meanders of the river. Its apparent absence from nearby sinuous reaches may be an indirect result of channelisation downstream, and reinstatement of old meanders that will effectively hold water in the catchment for longer, should result in an increased abundance of aquatic habitat on the floodplain.

The presence of *Omphiscola glabra* in some of the paleo-meanders of the Black Water is key in terms of conservation interest. Post-restoration monitoring should include an assessment of the impact on existing populations of this species, and securing its long term future in the floodplain is one criteria by which the success of the restoration work should be judged.

Multivariate analysis of invertebrate community structure

- In 2003, at only four months post restoration, the data from Rhinefield on the Black Water showed an aquatic community in a very 'raw' state, differing greatly from the reference reach in that year in every respect. By sixteen months post-restoration, data collected suggested that the situation was vastly improved. The two communities were very similar in terms of the species present, biological diversity and evenness; and there is good evidence to suggest that structural elements and fluvial processes required for this end point to be reached are now in place.

- It is possible to define the community difference at 16 months post restoration in terms of the abundance of a small number of key taxa, and relate this primarily to disturbance factors. Productivity is higher in the restored reach, not least because channel length has been dramatically increased. Community analysis, however, shows that a statistically real difference still exists between the two communities.

The 'end-point' (as defined in Muotka & Laasonen, 2002: Ormerod S.J., 2003 (see Annex 9.19)) at which ecological structure and function does not differ significantly from that in adjacent and natural or un-degraded habitat had therefore not been reached sixteen months post-restoration.

Omphiscola glabra (the 'Mud Snail')
The distribution of *O.glabra* in the floodplain at sixteen months post-restoration was pleasing for a number of reasons. Given the rarity of the species at catchment scale and its conservation significance, losing *O.glabra* from the reach would have been an unacceptable outcome.

- The current distribution was evidence of well-planned mitigation, a single meander of the reach having been re-connected at a later date, following translocation of sediment containing the species to marginal habitat. It also illustrated the importance of a flexible approach to managing river restoration projects. Habitat structure and floodplain hydrology is now such that the species' long term future in the reach is assured.

Recommendations for further monitoring
Based on the evidence collected so far, a full recovery of the aquatic community is anticipated. However, samples taken in autumn of 2005 will need to be analysed to determine whether the Rhinefield reach of the Black Water has yet reached favourable condition. It is recommended that this analysis be carried out at the earliest opportunity. The data gathered so far offers a unique chance to measure long-term recovery of an aquatic fauna from habitat restoration, and to relate those changes to geomorphological changes, due to an extensive, high quality data-set gathered by Southampton University. A collaborative paper is planned, publication of which would inform and guide future river

restoration projects and their appraisal. And, in the context of Life 3, analysis of these samples will determine whether or not the end-point of restoration, as defined earlier, has been reached.

Further work is planned on the Highland Water, where pre-restoration data exists, that will monitor the recovery of the fauna following restoration techniques that called for the introduction of large quantities of gravel, and the construction of new channel.

Fisheries survey work

Baseline survey
In 2003 fifteen sites were surveyed in the Lymington catchment for assessment of fish biology. A selection of sinuous and channelised reaches were studied. Results showed that overall, species diversity did not change between sinuous and channelised sites. Brown trout, bullhead, eel, lamprey, minnow and stone loach were captured in both sinuous and channelised stretches. Sinuous stretches contained an overall larger number of fish when compared to the channelised stretches.

Lamprey were most abundant in pool habitats with suitable silt sand deposits associated with sinuous sites and were less abundant in the channelised stretches. Lamprey size did not vary between sinuous and channelised sites. Density of bullhead was higher in the channelised stretches, but individuals were significantly heavier in the sinuous sites. Brown trout dominated the fish community both in terms of density and biomass in both sinuous and channelised stretches. Densities of brown trout were higher in channelised stretches however, fish in the sinuous stretches were significantly larger.

Growth rates of brown trout were on average higher in channelised sites in the first year. However, in subsequent years sinuous sites revealed faster growth rates. Good numbers of 1+ brown trout were found in both sinuous and channelised sites. More 2+ brown trout were caught in the sinuous sites compared with channelised sites.

Post restoration survey results (see Annex 9.20)
In 2006 fifteen sites were surveyed in the Lymington catchment for assessment of fish biology, a selection of sinuous and channelised reaches were studied. The most frequent species found were brown trout / sea trout, bullhead, eel, lamprey, minnow and stone loach. Pike, chub and bleak were also recorded. No significant difference in species diversity was identified between 2003 and 2006 and between control and impacted sites. Brown trout/sea trout and bullhead density reduced significantly in impacted stretches before and after the restoration work. Species composition altered in both control and impacted sites between 2003 and 2006. At least five age classes of brown trout/sea trout were present in 2006 at control and impacted sites. On average, total biomass (all species) reduced at both control and impacted sites between 2003 and 2006. The length/weight relationships for brown trout/sea trout were not statistically different between control and impacted sites in 2006. The density of *Salmonids* was lower than would be predicted for the habitat available at all sites in 2006.

The restoration work has increased the overall channel length and re-established sinuosity. This has increased the number of river habitats available. It is predicted to be of benefit to certain sizes of *Salmonids* and fish populations as a whole. The increased physical and hydrological diversity at the sites has stabilised some fisheries habitat (particularly spawning gravel) and has created new habitats that have yet to be fully exploited by fish populations. In May 2006 the fisheries ecology had not recovered to the pre-restoration levels when comparing control and impacted sites. However, fish density at control sites was also lower in 2006 than in 2003 and indicated the high natural temporal variability in fish populations. The response of fish populations would be expected to continue over the next few years. It will therefore be essential to continue to monitor the response of the fish populations within the New Forest in years to come.

6.5.3. F2.2 Monitoring project performance (FC) (see Annex 9.15)

In October 2003 a local contractor (Kitchenham Ltd.) undertook a flight to provide aerial photographs of many of the sites/areas targeted by the Life 3 project. In total 25 photographs were taken, detailing such areas as: Avon Water valley (including Holmsley Inclosure), Black Water valley (Dames Slough, Vinney Ridge), Ober Water (including Markway Lawn), Highland Water (including Sporelake Lawn, Millyford Lawn and Highland Water Inclosure). The images provided a useful benchmark of the forest structure prior to the commencement of the works.

In addition, the FC worked with EN to record the condition of the habitat types by geographic units across the whole of the Forest area in a SSSI Condition Assessment database. Habitat units were classified as destroyed, unfavourable declining, unfavourable maintained, unfavourable recovering and favourable. Re-assessment of the Life units by EN helped to measure improvements in habitat as a result of the works. A total area of 1330 ha of SSSI units, divided across 35 sites, were found to have reached unfavourable recovering condition. These contained the 604 ha of key habitats which were targeted for restoration by the project (see Annex 9.4).

Walk-over visits to work sites following restoration, together with the results of the vegetation monitoring detailed below, have shown that habitat restoration is already starting to have a positive impact. Although it is still early in terms of habitat recovery, the first signs are emerging that vegetation communities are responding to changes in tree cover and soil moisture. Recovery has been particularly good in mire systems, especially those that have had a season or more to start recovery, for example at Slufters and Broomy Bottom. Vegetation change is also significant at Newlands Plantation.

Riverine habitat will take longer to reveal significant signs of change in terms of the development of true riverine woodland communities. However, the effects of seasonal flooding and restoration of geomorphological processes on the floodplain is already noticeable. This is particularly evident when walking through restored areas such as Dames Slough, Red Rise/Markway, and parts of the Black Water and Highland Water that experienced more frequent inundation through the winter of 2005/06.

Across the three target catchments the FC has also employed the use of fixed point photography to record both vegetation and wider landscape change on sites which were restored under Life 3. From these points photographs were taken before works commenced, often during the operation, and after the works ended, to show the final results. It is hoped that the restoration of these sites will be recorded by this photographic method beyond the end of the Life Project. Fixed point quadrats measuring 25m x 25 m were set up at Wootton, Vinney Ridge (Black Water) and Dames Slough. In addition three transects were surveyed using 1m2 quadrats placed at 10m intervals across the flood plain at Dames Slough in order to monitor changes in vegetation communities associated with increased flooding and habitat restoration. In areas that were completely cleared of conifer and the river modified, for example through Dames Slough, the early stages of succession have already started. Monitoring of vegetation shows subtle changes in species distribution starting in response to soil moisture variations. Vegetation is also starting to colonise the once bare ground. The introduction of grazing by ponies is already making a significant impact with areas of lawn starting to develop along the floodplain.

At a more detailed level species monitoring was undertaken both inside and outside the deer exclosure plots in order to assess the impact of different levels of grazing on the development of riverine woodland. The comparison of vegetation communities within grazed areas (by both deer and horses) against areas within Exclosure Plots revealed quite striking differences in the vegetation succession, not so much in general species composition but more in terms of the density of key species such as pioneering birch. As would be expected, the density of broadleaved saplings of oak, ash and hawthorn was strongly correlated to the presence of a nearby "mother tree".

It will be interesting to see, through continued monitoring of vegetation communities into the future, how quickly typical NVC communities attributable to the target habitat types develop and what variations may occur but it is clear that the process has already started.

Throughout the period, before and after photos were taken of practical work, and areas restored were plotted on a Geographical Information System (GIS) – see Annex 9.3. Future site maintenance requirements were noted and incorporated into both the GIS database and the wetland management plan – practitioner's guide to ensure that the sites are managed appropriately to continue the habitat restoration objectives achieved under the Life 3 project.

6.5.4. F2.3 Wading bird survey (RSPB)

From the 31 1km squares re-surveyed for breeding waders in 2004, pairs of breeding lapwing showed an increased of between 34 and 39% since the last survey in 1994. However, numbers of snipe, curlew and redshank pairs had declined by 29%, 25% and 22-26% respectively, when compared with the 1994 survey results. When extrapolated to provide total population estimates for the entire New Forest valley mires, these changes were not found to be statistically significant, but may be indicators of a trend at a Forest-wide level.

The results confirm that the New Forest valley mires remain extremely important for breeding snipe, curlews and redshanks. In a wider context, the breeding wader populations in the New Forest are of considerable significance. The population of snipe represents nearly 6% of the English population. The curlew population represents 15% of the southern England regional population; and, beyond the coastal locations where the majority of redshanks in southern England breed, the New Forest redshank population represents 1.5% of southern England numbers. Although no regional population estimate currently exists for breeding lapwings, the number breeding in the New Forest is also likely to be of regional importance

6.5.5. F2.4 Surveys and photographic monitoring (NT)

The survey work carried out at Dockens Water and Newlands Plantation has enabled the project to gain a greater understanding of the positive changes to both the landscape and to the habitats which have been restored. The findings show the beneficial changes to the vegetation for species such as Snipe (*Gallinago gallinago*). The surveys provide a useful tool to keep the general public, working groups and partners informed about the benefits of the NT project work. All results/findings have been collated to produce the final NT monitoring report (see Annex 9.21). Before and after photographs were taken continuously during the period of works. These were used for presentations, and to update the communications photo library. The pictures were compiled as part of the final NT monitoring report.

On 7 July 2006 the NT national nature conservation team visited the restoration works at Newlands. A dramatic change was noted since the previous biological survey in 2002, following the clear felling of conifers to the north of Dockens Water at Newlands Plantation. This was most evident within the wetland habitats along the valley floor, where mire habitats were showing signs of rapid recovery, together with colonisation of notable species. Bog mosses (*Sphagnum spp.*) are now common in some areas, supporting other mire plants e.g. sundews (*Drosera spp.*). These open mossy habitats also provide valuable invertebrate habitat and there has been a remarkable colonisation by mire associated species including Nationally Scarce species restricted to mires such as small red damselfly *Ceriagron tenellum*, bog bush cricket *Metrioptera brachyptera* and the water beetle *Helochares punctatus*. Other notable species include the beetle *Aphodius niger*, a Red Data Book Endangered species restricted to the New Forest within the UK; and the raft spider *Dolomedes fimbriatus*. None of the above species were found during the 2002 survey, when the site was covered in a dense stand of conifers.

The Life 3 project has completely transformed the sites at Newlands Plantation and Dockens Water, with restoration works that are believed to be the biggest to date on a single National Trust site. It was expected that the site would begin to revert back to mire conditions after the work had taken place, but for the site to recover so dramatically in such a short time and begin to make the transition from a monoculture plantation to a semi-natural functioning mire contiguous with the surviving mire habitats upstream, is a major achievement.

The Life 3 project enabled the National Trust to carry out large scale works across Newlands Plantation and Dockens Water that would have been impossible to achieve in the same length of time outside the project. This is an excellent start for a site that was itself acquired using a grant in 1999 through the Life 2 project. A link has been recreated between pre-Inclosure and Inclosure land which includes opening up the Inclosure to New Forest stock and reinstating the grazing regime. With the removal of conifers from the stream edge, grazing animals are now feeding along the river corridor and the remaining hardwoods will in time restore the structure of riverine woodland.

The extensive clearance that has taken pace in Newlands Plantation and the new open wetland areas created should in time further develop into areas of bog woodland. The project has also opened up a stretch of Dockens Water and created an ideal habitat for *Salmonids* and invertebrates. The results of the 2006 biological survey demonstrated the variety of different mire and bog species that had already begun to colonise the Newlands Plantation site. The monitoring of the Life 3 project provided the NT with a detailed understanding of the processes that were taking place at Newlands Plantation and Dockens Water. The works have further enhanced the habitats of Ibsley common and the wider New Forest SAC.

The actual cost of the F2.1 – 2.4 actions was €84,897, compared with an estimated cost of €176,144.

A full list of surveys, reports and partners' data produced during the project is found in Annex 9.14.

7) Evaluation and conclusions

7.1. The process

Proposal, initiation and feasibility
The previous LIFE 2 project, which ended in early 2001, showed that wetland habitats, e.g. valley mires, could be successfully restored, but it also highlighted the need for an integrated approach, based on a sound understanding of the hydrological networks. The proposal, which set out to restore 604 hectares of priority wetland habitats, was submitted in March 2002, and accepted in May '02.

Managing the project start
The project started in July 2002 and HCC recruited a project manager and an administrative co-ordinator, both starting in August 2002. The initial work set the terms for the future management of the project. Key early outputs were the production and signing of the partnership agreement, and a detailed project handbook which enabled all partners to clearly see how the project partnership would be managed by HCC, and what the roles and responsibilities would be. The handbook also contained the communication strategy, which set out the objectives for the project's communication activity and the framework within which the various parts of the strategy would be co-ordinated and managed.

The first PMT meeting was held in October '02, bringing together all partners and new staff for the project for the first time. The launch event in December '02 cemented the partnership organisations and their staff. Initial PMT meetings focussed on refining the project, its objectives, actions and partners' responsibilities. Several discussions were held on the application and the SAP in order to clarify their meaning for all partners.

Managing implementation and progress

The main term of reference for guiding the implementation was the project application, or bid. Partners produced individual work plans for their own actions, which were discussed and agreed at PMT meetings and then communicated to and consulted over at WBMF meetings (and sometimes vice versa). In this way all partners have been fully aware of each others work programmes and key stakeholder groups have been fully involved in the decision making.

Through the PMT the beneficiary and partners have successfully implemented and controlled the project. A schedule of project meetings and claim periods was produced for partners. HCC, Forestry Commission and the Environment Agency also prepared project plans for their own actions. The four-monthly technical reports were invaluable for HCC to monitor partner's progress, and to enable the informed assessment of financial claims. The information from the technical reports was also used to compile the technical reports for the Commission.

A separate communications team was set up, guided by the communication strategy and chaired by the Communication Co-ordinator, who reported back to the PMT.

7.2. The project management, the problems encountered, the partnerships and their added value

Project management

A high standard of project management activity was maintained over the duration of the project, with three Project Management Team meetings being held per year. Of these, one was held at the Forestry Commission's office in Lyndhurst. It was followed by a site visit for project staff, which enabled all members of the PMT to see progress on the ground, and discuss issues with site-based staff.
A number of inspection visits were made by the European Commission's desk officers during the project, with favourable feedback and support being received by the project. These consisted of an indoor meeting with the beneficiary, followed by site meetings with the beneficiary and partners. The visit on 2 August 2005, with John Stuebler visiting, together with John Houston (Ecosystems) introduced three staff from the new external monitors (Astrale-HTSPE Ltd). The main focus of this meeting was the interim financial claim, and several changes were recommended by the Commission/monitors which were later implemented.

Regular liaison was held between HCC project managers and finance officers over grant claims and variances. HCC finance staff also gave considerable advice and assistance to partners in connection with their four-monthly grant claims from HCC, including visits to EA, FC and NT over the last year. Phased spend plans for each partner were prepared by HCC's devolved finance unit. A method for carrying out financial health checks was devised, incorporating lessons learnt from LIFE 2, and these were undertaken on all partners during the project's duration.

A major piece of work was the preparation of the Interim report, SOE and claim, which were submitted to the Commission at the end of February 2005, then revised and re-submitted in September '05. Since the UK was not part of the Eurozone, and the project's implementation was carried out using pound sterling, regular monitoring of the Euro/UK pound exchange rate was an important feature. The system for managing partners variances meant that full details of each variance were submitted and the project finance team could keep a clear picture of changes to the budget and the financial implications in order to manage the project within the SAP limits.

Partnerships

The project partnerships have worked very successfully. The set up phase of the project involved the process of forming the different teams (Project Management and Communications Teams; WBMF), as well as the setting up of project groups within the partner organisations. The roles and responsibilities of both the PMT and the Forum have been well-defined. The project handbook has proved to be a useful tool for guiding the partners, and has been valuable for new staff joining the project. One of the great strengths of both the PMT and the Forum has been the breadth and depth of experience and specialist knowledge of the different organisations and their staff. These qualities have been shared freely and openly, both within and beyond the Life 3 partnerships. The presence of the Environment Agency as a new member of the New Forest LIFE Partnership has been extremely valuable, bringing in new practical skills and knowledge to benefit the SAC.

The Water Basin Management Forum made good progress in developing partners' work plans and facilitating consultation and decision making, sometimes over sensitive issues and/or sites. The project was commended by several members, including the Commoners and Verderers, on the progress made so far, on the practical achievements, the professionalism of the staff, and on the level of open-ness and trust which had been developed.

7.3. Successes and failures of the methodology applied, results of actions conducted, cost-efficiency of actions

Successes and failures of the methodology applied

A1.1 - 1.6 Water Basin Management Forum

The methods used to set up and run the Forum proved very successful and can easily be replicated elsewhere in the EU on other projects and initiatives. The Forum was crucial in securing support for the project, both at grass-roots level and from land management organisations (thus lending it additional credibility).

A3.1 Detailed physical surveys

The Geomorphological survey report prepared in Year 1 was useful in gathering baseline information. It suggested a range of restoration options that would initiate a semi-natural pattern of connectivity between channel and floodplain. These included: reducing the bed-level relative to floodplain; decreasing river bank height; increasing channel sinuosity; and increasing the frequency of debris dams.

The topographical survey provided valuable information on river bed levels and helped to guide the detailed river restoration plan preparation.

C1.1 Restoration of remaining areas of riverine woodland

Pollarding, exotic removal, holly management, scrub removal/management were successfully undertaken using techniques described in the WMP and Practitioners Guide. The work provided woody material to "roughen" the floodplain - this slowed down flood water and supplied Large Woody Debris for the formation of debris dams. With the oak, ash and beech pollarding it proved difficult to locate the actual number of pollards given in the application, on the ground. To make up the numbers, some alders occurring within the Inclosures were pollarded. Because of the large number of pollards set as an achievement target, the trees which were cut were generally young, and less than 30 cm diameter, rather than the large veteran trees which show evidence of past pollarding. These large trees require very sensitive management, which is also more costly, and occur at a much lower density than the younger trees.

C2.1, C2.2 Restoration of links between pre-Inclosure riverine and bog woodland and nearby networks

Conifer and rhododendron removal; fence re-alignment; construction of stock fencing and introduction of light grazing were the methods used for these actions, and again these are described in detail in the WMP and Practitioners Guide. Where occurring close to stretches of river due for restoration, stands of conifers or other exotics were felled prior to river restoration taking place. Seasonality effected the timing of harvesting work, which was generally halted in spring/summer during the bird nesting season. During wet winter periods when river levels were high it sometimes proved difficult to harvest timber, because rivers and ford became impassable.

The removal of conifer stands from the floodplain had a dramatic impact on the landscape, and the re-colonisation by wet grassland and mire habitats occurred quite rapidly on some sites. Although deer fencing was proposed in the application, discussions at WBMF meetings led to a re-appraisal of the use of fencing, and the consultant Neil Sanderson recommended the use of stock fencing instead. This was to enable the return of low level livestock grazing to achieve the right kind of woodland structure, more akin to wood pasture than plantation forestry. Additional benefits included control of bracken and *Molinia*. The re-alignment of fences carried out through the Life 3 project led to new areas being opened up for grazing by Commoners' stock, which gained valuable additional support from the Commoners. Many of the deepest drains within the Inclosures were infilled to improve the hydrology, but an additional benefit has been reducing the dangers to livestock from injury or drowning.

C3.1 Restoration of valley mires and wet grassland

Scrub removal was carried out using chainsaws or tractor mounted flail. Cut material was gathered up and burnt when weather allowed. Sometimes this meant that the cut material was left lying on the ground between winter cutting and spring burning/collection, although this caused few problems. Restoration of these habitats on the open forest or in Inclosures where grazing was permitted, was subject to lengthy and detailed negotiations with the communing community. These generally led to positive outcomes, though often involving some compromise, but on some sites work was not carried out or was delayed due to the concerns of the Commoners/Verderers.

C4.1 – C4.3 River restoration

The techniques proposed to carry out the river restoration work were explained and well-illustrated in the River Restoration report produced by Environment Agency and contained in appendix 4.6 of the Year 2 progress report. The following techniques were used successfully: installation of log weirs to trap sediment; bed level raising where channels had become over-deepened; restoration of flow back into natural meanders; and installation of debris dams. In carrying out this work, the susceptibility of the soils to damage from use of heavy machinery was an important consideration, particularly during periods of heavy rainfall, e.g. during August 2004. In such instances, delays to completion of works were incurred as progress was halted to avoid damage to soils and vegetation.

Maintaining good public relations with the local community was also particularly important with the river restoration, which was a new concept to many people in the New Forest. Some local opposition occurred early on, during 2003/04, and lobbying from opponents to the work led to DEFRA requesting an EIA. Although this showed that the work would not prove damaging to the SAC, or to loss of grazing, there were delays of several months incurred while the whole EIA/Environment Agency process and its consultations, were carried out.

During engineering works there was some localised disruption to recreational routes, which were temporarily re-routed. In such cases, good signage was important, and efforts were made to maintain, and even enhance crossing points wherever possible.

Observation and monitoring of the results of the river restoration showed that it was very successful in restoring natural processes and in re-connecting the rivers with their floodplain, despite some very low flows caused by an ongoing drought situation over the past two years. The river restoration was also integral to the restoration of the key wetland habitats, such as riverine and bog woodland. In addition, through drain blocking and raising bed levels, the project has slowed the hydrological response of the Highland Water catchment, with increased travel times for flood peaks. Preliminary modelling of flood risk showed that there would be a small net benefit in reducing flood risk.

There are many lessons to be learnt from the hydrometric monitoring of the project including:

a) better consideration of monitoring station locations,
b) ensuring a more active role of the EA hydrometric monitoring team in the restoration process so that monitoring sites are not altered,
c) immediate installation of monitoring sites once a project is underway to gather the most pre-restoration data,

d) more consideration of flooding monitoring (e.g. it would have been useful to monitor water levels in the wetland itself to prove any increased over-banking).

Section 4 of the Wetland Management Plan (Annex 9.24) and the summarised version (Practitioner's Guide, Annex 2.25) contain detailed descriptions of all of the above restoration techniques (from C1.1 to C4.3), with evaluations and unit costs.

E Communications

The project benefited from having a Communications Co-ordinator, supported by the Communications Team, and from having the guidance of a communication strategy. The project website proved to be a valuable source of information to the public, along with newsletters, press releases and the leaflets. The public events were well attended, and the project team produced some very innovative ways of communicating with the public, such as the interactive stand at the New Forest Show in 2004. The end of project events in 2006 were the product of a huge amount of work by the partnership, and both the high level signing - off event and the two - day conference were very successful.

F 2.1 – 2.5 Monitoring project performance

The macro-invertebrate survey by the Environment Agency was useful in demonstrating differences between, channelised and sinuous reaches, but further analysis of results is required to show positive differences post-restoration. Likewise for fisheries, more time is needed, followed by later surveys, to show demonstrable improvements in fish populations following restoration. Forestry Commission's fixed point quadrats were useful in showing the effects of deer browsing on vegetation and the walk over surveys showed the rapid colonisation of mire and wet grassland habitats following restoration. The NT's biological survey and photographic monitoring were effective in demonstrating the importance of Newland's Plantation, and of the positive effects of restoration. The RSPB wader survey was valuable in showing the importance of the New Forest for breeding waders.

Results of actions conducted for potential target groups

The following target groups have been identified, with results/benefits:

- Biodiversity & wildlife – improved habitats – increased area, better quality; return of natural processes e.g. seasonal flooding.

- Commoners/Verderers – increased area and improved quality of grazing through scrub and tree removal and fence re-alignment. Improved health & safety for stock through in-filling or raising of previously dangerous channels.

- Fishing interests – more natural behaviour of rivers, greater in-stream habitat diversity which will benefit fish diversity, and re-instatement of gravel bed substrate, valuable as spawning areas for brown trout

- Recreation – a more open, appealing landscape, with improved access for walkers along river corridors and across some mires and streams.

- Property owners downstream – reduced likelihood of flooding downstream due to greater floodwater storage capacity upstream of settlements e.g. Lyndhurst

- Local contractors – employment created for foresters, machinery operators, ecological consultants

- Professional conservation managers – increased skills and knowledge, awareness and understanding of New Forest wetlands and their management. Demonstrations/events have been held to promote achievements to peer groups.

- EU departments/affiliated bodies – presentations on the project have been given at a wide range of conferences, seminars and workshops, e.g. forestry conference in Vittoria; Green Week; WFD workshop in Brussels.

- Local people and visitors – lots of educational events were held, e.g. guided walks, talks, attendance at shows and festivals; publications made people more aware of the project, as did the website.

Cost-efficiency of actions

Action A1.1 – 1.6: – Water Basin Management Forum
The total actual cost was €129,678, or 76% of the,estimated cost of €171,098. The expenditure was lower than estimated, as meetings lasted for half a day rather than a full day, reducing the cost of venue hire and staff time. Savings were also made on publication of draft management plans and implementation plans through use of e-mail to send electronic copies instead of printing paper versions. Additional savings were made by FC engaging an ecologist onto their staff, rather than using a consultant for advice and field survey.

Action A 3.1 Detailed Physical Surveys of the Upper Lymington River and Adjacent Floodplain. The total actual cost was €127,930, representing 86% of the estimated cost of €148,320. The reduced cost was mainly due to less EA staff time being required to carry out the survey work than anticipated.

Action C1.1: Ensure the favourable condition of riverine woodland and stimulate natural succession. The total actual cost was €187,850, compared with an estimated cost of €286,371. The actual costs were therefore only 66% of those estimated. This was mainly due to staff being used to carry out work originally planned for contractors, resulting in a saving of €67,000. In addition, their was considerable variation in the size of the trees which were pollarded and the average unit cost was lower than forecast.

Action C2.1: Restore links between pre-Inclosure riverine & bog woodland and nearby networks and stimulate natural succession on the Crown Lands
The total actual cost was €536,159, compared with an estimated cost of €683,526. A variety of tasks were undertaken to achieve this action, and in total, these cost 78% of the estimated cost. However, some of the cost reduction was due to €42,622 of the budget allocation being moved to C3.1 to increase funding for mires and lawn restoration. This was reported to the Commission in the year 2 progress report.

Action C2.2: The restoration of links between pre-Inclosure riverine & bog woodland and nearby networks and stimulate natural succession on the National Trust Land
The total actual cost was €116,826, compared with an estimated cost of €130,668. This represented 89% of the estimated cost, which was fairly close. The lower figure was partly due to the loss of specialist NT forestry staff early on in the project, although the work was achieved by engaging contractors.

Action C3.1: Restoration of periodic inundation patterns in the upper catchments to maintain stream water levels throughout the year on the Crown Lands: Valley mires
The total actual cost was €428,147, compared with an estimated cost of €352,045. The mires and lawns proved more expensive to restore than anticipated, partly due to the large number of heather bales which needed cutting for ditch blocking work. In addition, additional contractors were required to carry out the work to restore the total of 325 ha of mire/lawn, together with increased staff time to supervise them, due to the difficult and sensitive nature of the work.

Action C4.1-4.3: River restoration. The actual cost was €1,136,797, compared with an estimated cost of €1,537,254. The actual cost was 74% of those estimated, for 10 km of river restoration. The detailed methodology was only worked out and planned for each stretch of river as the project unfolded, and it was difficult to predict accurately what the final cost would be before the project began. The costs were lower partly because less heavy engineering was used, with more restoration using debris dams, and also there were some savings on material costs.

Action D2.1: Restoration of riverine woodland programme to coppice streamside habitats along the Dockens Water. The actual cost was €20,261, compared with an estimated cost of €21,764. This represented 93% of the estimated cost, which was very close.

Action E1.1 – E 1.5 Co-ordinating Project Communications
The actual cost was €98,295, compared with an estimated cost of €96,299. This exceeded the estimated cost very slightly, but only by 2%. This mainly was due to the large amount of time required to organise the end of project events.

Action E2.1 – 2.5: Events and community interaction The actual cost was €86,544, compared with an estimated cost of €81,144. The additional cost was due to the higher-than-anticipated costs of the end of project events. Two events were held instead of the one originally foreseen, but this was essential to ensure that dissemination of the project's results reached as wide an audience as possible..

Action E 3.1-3.5: Project publications: the project journal, the layman's report, news releases and leaflets. The actual cost was €41,869, compared with an estimated cost of €42,091. The actual cost was very close to the estimated cost, at 99.5%. All of the planned publications were produced, including the Layman's report and project film (DVD).

Action E4.1 – 4.5: Project website. The actual cost was €9,805, or 56% of the estimated cost of €17,577. Although originally planned to be designed by consultants, the website was created in-house using staff, which proved to be much more cost-effective.

Action E 5.1 – 5.3: On-site interpretation and temporary operation signs. The actual cost was €6,907, compared with an estimated cost of €14,668. The actual cost proved to be only 47% of that estimated. This was mainly due to partners making their own signs, which were relatively inexpensive.

Action F1.1 – 1.6 Overall project management: The actual cost of the was €799,842, compared with an estimated cost of €825,294. The actual cost was 97% of that estimated, which was very close, given the order of overall project management costs.

Action F2.1-2.4 Ecological monitoring: The actual cost of the F2.1-2.4 actions was €84,897, compared with an estimated cost of €176,144. The actual cost was only 48 % of that estimated. This was due to a combination of factors, including use of Environment Agency staff to carry our surveys rather than consultants, and other partners' costs, particularly Forestry Commission, being lower than anticipated.

All of the above costs were reduced by a fall in the exchange rate since the start of the project.

Section 4.4 of the Wetland Management Plan (annex 9.3) lists unit costs for different actions, including lawn restoration; mire restoration; removal of exotics; river restoration and holly management.

7.4. Comparison against the project objectives

(Refer to summary table, page 10.)

Measures have been carried out within three of the six main water basins (R. Lymington, Avon Water, Hampshire Avon), as proposed in the application. The majority of works were undertaken within the Lymington river catchment. Of a total area of 604 ha of priority habitat planned to be restored, the target has been met in full.

Through the formation of the WBMF, a mechanism has been developed to establish the long term sustainability of the wetlands. The creation of suitable conditions for the regeneration of further areas of priority habitat beyond the end of the project has begun. Results of the habitat restoration against target are as follows:

- 279 ha of riverine and bog woodland have been restored out of a target of 279 ha
- 184 ha of valley mires have been restored out of a target of 184 ha
- 141 ha of wet grassland ("lawns") have been restored, out of a target of 141 ha
- 10 km of river restoration was achieved

Therefore all of the aims and objectives have been met.

7.5. Environmental benefits, policy and legislation implications

Conservation benefits
The primary reasons for unfavourable condition of the New Forest SSSI (SAC, SPA and Ramsar site) in the units where the LIFE project work has been carried out, were the following :

- headward erosion
- damage due to past drainage
- river channel modification
- expansion of secondary woodland on wet grassland and mires
- lack of holly pollarding
- presence of non-native/exotic trees.

Headward erosion, damage due to drainage and river channel modification were addressed through the river restoration work. The river restoration has also contributed to favourable/unfavourable improving condition being reached for riverine woodland and bog woodland. Various characteristics of healthy rivers e.g. riffles and debris dams, feature on the site condition assessments for these habitats.

The expansion of secondary woodland on wet grassland and mires was addressed through tree and scrub removal, and re-introduction of holly pollarding through action C1.1 benefited the remaining riverine woodland. Non-native and/or exotic trees were removed and this contributed to the riverine and bog woodland moving towards unfavourable recovering condition.

The LIFE project focussed direct restoration work on the areas of damaged habitats detailed in section 7.d above. However, because the damage has had a much wider impact on the habitats, the project has had the potential to work towards delivering favourable condition over a larger area both during and after the lifetime of the project. The potential area of recovery is over 1,300 hectares of SSSI within which the 604 ha of wetlands restored by the project are found.

Walk over visits to Life 3 work sites following restoration, together with the results of vegetation monitoring show that habitat restoration is already starting to having a positive impact. Although it is still very early in terms of habitat recovery, the first signs are emerging that vegetation communities are responding to changes in tree cover and soil moisture. Recovery is particularly good in the mire systems, especially those that have had a season or more to begin recovery, for example at Slufters and Broomy Bottom. Vegetation change is also significant at Newlands.

Riverine woodland habitat will take longer to reveal significant signs of change in terms of the development of true riverine woodland communities. However, the effects of seasonal flooding and restoration of geomorphological processes on the floodplain is already noticeable. This is particularly evident when walking though restored areas such as Dames Slough, Redrise/Markway Lawn, and parts of Black Water and Highland Water that experienced more frequent inundation through the winter of 05/06.

In addition to these habitats, the associated species have benefited and will continue to gain in the longer term as further areas of priority habitat regenerate. European priority fish species to have benefited from the river restoration include sea trout, brook lamprey and bullhead.

Upstream, on the open mires, southern damselfly (*Coenagrion mercuriale*) has benefited from work to reduce headward erosion of streams onto the mires and directly by mire restoration techniques. The mire and wet grassland restoration have also been of value to the great-crested newt (*Triturus cristatus*), and the seasonal flooding resulting from the river restoration will help to maintain water levels in their breeding ponds.

Under EC Directive 79/409 on the Conservation of Wild Birds the site is notable for its breeding populations of wading birds – redshank (*Tringa solitaria*), lapwing (*Vanellus vanellus*), curlew (*Numenius torquata*) and snipe (*Gallinago gallinago*). These all featured in the breeding wader survey carried out by the RSPB in 2004. They should all have benefited from the restoration of mires, wet grassland and rivers carried out during the Life 3 project. It was highly encouraging to note the presence of wader species, notably curlew and lapwing, on the cleared areas within Markway Inclosure, which a few months earlier had supported dense conifer stands.

Clear felling of conifer stands on the floodplain has created new habitat for Annex 1 bird species e.g. nightjar (*Camprimulgus europaeus*) which favour recently created clearings and glades within a heath/woodland mosaic for foraging. Nightjars were also present in a number of the exclosure plots set up in Highland Water under the Life 3 project. Other bird species likely to gain from the project include riverine species such as common sandpiper (*Actitis hypoleucos*) and grey wagtail (*Motacilla cinerea*).

It can be concluded that there are already a number of positive changes to wetland habitats in response to work carried out under Life 3, providing real benefits to New Forest priority SAC habitats. The project has played a very important role in the implementation of the SAC management plan, which was an output of the LIFE 2 project. The project has actively restored the only two European priority habitats listed in the plan - riverine woodland and bog woodland. Other European habitats contained in the plan and restored were Transition mires and Molinia meadows (wet grassland). The New Forest is of outstanding significance for all of these habitats.

Relevance to the EU legislative framework (directives, policy development, etc)

Habitats Directive

The EU funding acted as a catalyst in persuading partner organisations to join forces and work together. The project partnership has worked well in integrating the work of the different partners, and potential problems have been avoided via discussion between members of the Regulations Working Group. This Group was formed to negotiate the complex series of rules and regulations which are exercised by the Statutory organisations in the New Forest, together with requirements of the European Directives. The input of this Group, reporting back to the Forum, has helped to smooth out the relationship between the Habitats Directive and a number of other Laws and regulations.

Forum members, especially the Commoners and the Verderers have offered constructive suggestions to improve ways of doing things in certain places, for mutual benefit (project and livestock). Throughout the project, partners have had to maintain an awareness of the fact that the New Forest is a unique working environment, with ancient rights and practices which are enshrined in Law – as such it is both a physical and cultural landscape. The requirements of these traditional practices form one of the many contexts (and sometimes constraints) within which the project operates. This balancing of traditional and innovative approaches is a recurring feature within the management of Natura 2000 sites.

This project has been instrumental in bringing about sustainable solutions for restoring a range of wetland habitats over a large (by UK standards) area. It has improved the knowledge of different habitats' requirements, which is being shared more widely within each partner organisation, thus having an impact beyond the New Forest SAC. The inclusion of progress reports and technical papers on the project website has given other site managers elsewhere in the UK and in Europe access to the methodology and results of the project. The two day technical conference held in June 2006 was also valuable in disseminating the results of the project to site managers, policy makers, conservation officers, scientists and academics. The contents of the conference including presentations are posted on the project website.

One important aspect of the project of interest to the Natura 2000 network was the successful communication work carried out. The project was featured as an example of good practice in a recent EU guidance publication on dissemination. Links with the Natura 2000 network have continued to be established, and the project has been registered under the Natura Networking Initiative (NNI), and on the Eurosite website. The Life 3 project website contains a section explaining Natura 2000, the Habitats Directive and the Water Framework Directive.

The project has brought the two priority habitats (riverine and bog woodland) into unfavourable-recovering condition. Favourable condition has not been arrived at within the short timescale of the project. It is important to bear in mind that the practices which caused damage to the wetland habitats (e.g. land drainage, straightening and deepening of rivers and streams) occurred over a long period of time during the past 200 years. Although it is not possible to completely overturn this historic damage very quickly, significant progress has been made in halting and then reversing the processes causing the damage.

EN and FC carried out site condition assessments – the 604 ha covered by the project sits within a number of monitoring units totalling just over 1300ha, so one benefit of the project will be a much larger area moving towards unfavourable recovering status (see Annex 9.4). The project has helped Government agencies (EA, EN, FC) to meet their Public Service Agreement (PSA) targets for biodiversity improvements.

Gains to biodiversity from the project will be reported on by the partners feeding into the new UK Biodiversity Action and Reporting System (BARS). The project has gained useful information on distribution and abundance of key species of national and / or European importance e.g. freshwater fish species - sea trout, brook lamprey and bullhead, along with wading bird species.

Water Framework Directive
The New Forest Life 3 project was one of the first to attempt to marry together the requirements of the Habitats Directive with the new Water Framework Directive, and has set pilot processes in place which will further the link between them.

There are a number of different stages of WFD implementation which the project can help to inform. These include River Catchment Characterisation, where partners will be consultees; survey data gathered by the project can be passed on to the EA staff carrying out this exercise. The Wetland Management Plan (WMP) prepared with the WBMF will be useful in assisting the Agency in preparing the River Basin Management Plan (RBMP) and sub-plans covering the New Forest. Due to the time lag between the end of the project (2006) and the consultation on draft RBMP's (2008), partners will need to ensure that the plans produced by the Forum are fed into the WFD process very early on.

Some of the techniques used in the project e.g. geomorphological audit could be replicated as part of the river basin characterisation and monitoring programmes to be undertaken by EA. Lessons learnt from the operation of the WBMF will also be passed onto the EA to assist in planning for the future public consultation over WFD. Forum members and their constituent organisations are now familiar with many of the water and ecology related issues, and with practical wetland and river restoration methods, and should be a huge bonus to the consulting authority (EA).

A presentation was given to the WBMF on the Water Framework Directive by the RSPB water policy officer Sarah Oppenheimer, which improved the members' understanding of the Directive and its relevance to the LIFE 3 project.

Project staff have worked alongside the evolving legislation. HCC staff provided comments to the UK government (via DEFRA) on consultation documents. Various seminars and conferences have also been attended by project staff to gain a better understanding of how the WFD will work. RSPB specialists have also given advice on the WFD to project staff.

An outstanding success was the two day technical conference held in June 2006 entitled " Wetland restoration at a catchment scale", which showcased the achievements of the project, set within a wider context. The event was attended by 65 delegates, including visitors from Ireland, Italy and the Netherlands. The combination of speeches, workshops and site visits worked very well, and the conference provided plenty of opportunities for networking. Delegates and speakers came from a deliberately chosen variety of organisations and roles. The conference demonstrated the catchment scale approach which the project has adopted, and which could provide valuable lessons to those responsible for implementing the WFD locally and at a national level. The conference was attended by Environment Agency staff from both of the RBD'S which the New Forest falls within.

Additional benefits
Linkages were developed with the newly created New Forest National Park; several of the Forum members have been appointed to the National Park Authority (NPA), bringing with them their knowledge of the project, its methodology and outcomes. HCC is working with the NPA towards it taking over the maintenance and hosting of the Life 3 website once the project ends, so that information on the project will continue to be available and maintained appropriately. It is also anticipated that the NPA will play a future part in managing communications over the Life project beyond 2006.

The RSPB, as a partner, has been able to give ornithological advice to project staff, when required.

7.6. Innovation, demonstration value

Aspects of the project which are particularly innovative include:

- The stakeholder group, and the methods of carrying out public participation. The WBMF was newly created to achieve an integrated and cohesive approach to wetland management. Its membership was inclusive of all the main groups and key individuals with an interest and expertise in New Forest wetlands. This partnership has brought new perspectives and has offered challenging views on how to do things. It has also brought about improved intelligence about the needs of the local community. The WMBF was also used as a model for the setting up of the River Ribble pilot on public consultation for the WFD, by the Worldwide Fund for Nature (WWF).

- Practical actions, particularly the river restoration techniques (see river restoration report, Appendix 4.6 of Year 2 progress report) and the scale of river restoration within the UK context. The river restoration was new to the New Forest – it had not been undertaken in this 29,000 ha protected area before. It successfully demonstrated the value of a carefully planned approach – baseline surveys fed into the preparation of work plans. These led to demonstration schemes, leading to evaluation and sharing of results; then in and turn to winning public support, before doing more river restoration the following year. Complementary achievements included the Environmental Impact Assessment, with the publication of an Environmental Statement, and a grazing report.

- A protocol for the management of woody debris within the forest, and particularly the Forest streams, has been developed by FC in consultation with EA and EN. This document has been circulated within the EA, including Head Office colleagues, who are distilling relevant sections for incorporation into the maintenance programme and work method statements of EA operational staff. The debris dams installed in the 'Forest via the Life 3 project also featured as a case study in a booklet on debris dams produced by the Staffordshire Wildlife Trust.

- The project has shown that it can draw on sources of considerable expertise e.g. Southampton University staff and post-graduate students for geomorphological and hydrological surveys; consultants for the grazing and fencing reports; in-house experts e.g. EA for macro-invertebrates and fisheries surveys and RSPB for wader survey.

- Very successful and imaginative promotion and dissemination methods. For example, project partners produced a jigsaw bearing the partners' logos for the launch event. Employment of a Communication Co-ordinator gave a valuable overview to project communications (rather than piecemeal or ad-hoc, as occurred under LIFE 2), and enabled a communications team to be set up and chaired. Particular successes include the exhibition at the New Forest Show in August 2004, which re-created and compared an un-restored stretch of river and associated habitats/species with a restored stretch and its associated habitats/species. The exhibition won the Best Large Stand award at the show.

- As a case study in river/wetland restoration, the project has created unique opportunities for long – term geomorphological & hydrological monitoring, especially as there were 20 years of pre-restoration data in existence for comparison. The results of the monitoring are of interest to specialist audiences around the world.

Demonstration value
The actions and activities carried out during the Life 3 project could provide examples of good practice in managing Natura 2000 sites for the following sectors: farming (pastoralism); forests; rivers; and wetlands.

There are possibilities for further application of the practical habitat restoration techniques, both within the New Forest and more widely. The WFD may drive further river restoration work in the 'Forest, following the example of Life 3. Other organisations have already been questioning the EA on river restoration works, with a view to conducting their own schemes. Expertise gained from the river restoration is also being shared more widely within EA's organisation and with the FC.

A section of the Dockens Water upstream of Ibsley Common was restored by the Hampshire Wildlife Trust (HWT), using techniques adopted from the Life 3 project. HWT deputy chief executive Clive Chatters said "without the Life 3 project demonstrating how river restoration techniques can be successfully implemented in the New Forest, this project would not have happened".

The key elements of the project; the river restoration, mire and wetland improvements, methodology of implementation and the processes of administration offer exemplars for other projects, in most cases for similar and occasionally for geomorphologically dissimilar sites. The practical techniques can be applied to other heathland and wetland environments as well as more dissimilar areas such as chalk streams and general commercial woodland restoration.

The processes of application for other site managers can be processed by sharing experience through literature, web sites and site visits. This is particularly achievable through the National Trust's own organisational structure and with established partnerships nationally.

The Life 3 project can be used as a good example of managing a partnership project. A high standard of project management has been applied, utilising valuable tools and techniques, such as the project handbook. The importance of careful planning during the set-up stage, establishing formal structures and relationships, with clear lines of communication, has been demonstrated. The project has highlighted the importance of having finance staff to create and manage the financial and accounting systems. A sound system for reporting within the project was devised, comprising both electronic and hard copies of technical report forms and claim forms being submitted by partners. The administration and financial protocols can be applied to a variety of large projects irrespective of funding source.

The project has been recommended by Ecosystems and Astrale to several new Life projects as an example of good practice for its project management tools. Some of these have contacted the project to request information on project set up, including the project handbook, partnership agreement and systems for internal reporting and making financial claims.

In addition, a methodology for submission of variance requests was designed, consisting of an application form giving justification and a spreadsheet showing the effect of proposed changes on the budget. These were fed into a master sheet managed by HCC. Substantial financial health checks developed from those in the Life 2 project were carried out for LIFE 3 partners.

Due to the varied and challenging nature of the project and the importance of the area within which it operates, there has been a growing level of interest in and enquiries about the project, both from within and outside the UK. In September 2004 a group of site managers from the Czech republic visited the project, hearing presentations from partners and attending a site visit. This was part of a tour of four Western European countries organised by the Institute of European Environmental Policy (IEEP). The Environment Agency, Forestry Commission, NT, and RSPB have also conducted peer group visits e.g. the Institute of Chartered Foresters (ICF).

7.7. Socio-economic effects

Figure 11 illustrates the number of direct posts (full/part-time) created by the project.
This is based on information contained in the principal project staff list, Appendix 4.14 to the Year 1 progress report.

Figure 4: Direct posts created by the project

Partner	FT posts (or equivalent) Created	PT posts(or equivalent) created	Total
EA	1	21	22
EN	0	2	2
HCC	2	4	6
FC	2	22	24
NT	1	0	1
RSPB	(2 seasonal)	4	6
Total No	6 + 2 seasonal	53	61

In addition, with such a large number of staff within the partner organisations (especially EA and FC), there is the wider potential for influencing other existing staff and for sharing good practice.

Other economic benefits include the value of the project budget spent locally on goods and services; which would have been enhanced through the multiplier effect. Benefits to health may have occurred through improvements to access achieved by clearance of conifers and other exotics from floodplain. Another social benefits is that through the Forum various diverse/disparate groups have come together to collaborate and have developed enhanced relations between their different member organisations.

7.8. The future: sustainability and continuation of the project and remaining threats

Conservation staff will be required into the future to maintain and encourage further wetlands to be re-established beyond the end of the project. Resources will need to be found by the partners to fund further habitat restoration and to implement the SAC management plan, due for revision in 2006. The partners will be able to input into the latter process.

Within the Life 3 partnership, project staff employed by Environment Agency , Forestry Commission and NT will remain within their respective organisations and will thus be able to continue to apply the knowledge and experience gained and to impart this to others within and outside their organisations.

In 2005 the New Forest achieved status as the twelfth National Park in England and Wales. This has required new administrative arrangements, and will bring additional resources to further wetland conservation, and to address a number of threats described in the wetland management plan.

The WFD might bring resources to enable further river restoration work to be carried out with the aim of achieving 'good ecological status' for the rivers and streams of the New Forest.

Based on the findings of the breeding wader survey, which indicated that the New Forest now holds regionally and nationally significant populations of these birds, the RSPB, EN and FC are proposing targeted measures to help protect and enhance their populations. The effects of such measures will be carefully monitored to help understand the possible reasons behind the apparent decline in numbers of three of the four wader species surveyed.

Due to the limitations in the data collected so far, it has been recommended that the Life 3 hydrometric monitoring continues to allow more data collection and to increase the opportunity for encompassing a wider range of hydrological conditions.

The results of the LIFE 3 project will continue to be disseminated via the project website, with the NPA taking over of the maintenance of the site.

The WBMF will continue to meet once a year for site visits to review the implementation of the WMP. Additional funding has been made available via the UK government's Rural Pathfinder scheme to carry out enhancement of a further 4,000 ha of SSSI/SAC wetlands within the New Forest. This work will be managed by Forestry Commission, working in close co-operation with English Nature. Hampshire was chosen to host one of four Pathfinder projects to be funded in England.

There is also a recently launched (April 2006) LIFE-Nature project on the river Avon SAC – known as "STREAM", together with another partnership project called the 'Living River', funded by the UK's Heritage Lottery Fund (HLF), which will be led by EN, and runs from 2006 – 2010.
In addition, EN, Forestry Commission and other organisations have applied to the HLF for a £50,000 grant to design a larger bid for further wetland restoration, anticipated to begin in 2008. This project would restore an additional 3,000 ha of wetlands. Partners will continue to fund ongoing maintenance using their internal budgets, aiming to meet the UK governments PSA target by of bringing all SSSI's into favourable/unfavourable recovering condition by 2010.

8. Comments on financial report

The summary table is included overleaf. HCC has worked closely with partners to ensure the expenditure met the project objectives effectively. All of the project objectives were met, but there were some transfers of funds required between budget headings. For example, the project originally set out to undertake the river restoration work through leasing equipment (excavators and dumper trucks), to be operated by EA personnel. However, experience showed that the equipment was not readily available for leasing, and the EA's specialist staff had been reduced. An alternative way of doing the work was chosen, using contractors with their own equipment and operators. This had the effect of increasing the External Assistance heading, whilst reducing the durable goods and personnel headings. Overheads were less than anticipated as a consequence of personnel decreasing. The National Trust also lost forestry staff due to internal re-organisation early on in the project, and had to contract out more work than was originally foreseen.

Travel costs proved to much lower than expected, partly due to the above reductions in staff. In addition, fewer visit to other LIFE-Nature projects, especially outside the UK, were made. Spending on Consumables was lower than estimated, since actual costs proved lower than anticipated, and in some instances (e.g. materials used by the Environment Agency for river bed level raising) were provided free of charge, apart from the transport costs (which added to the External Assistance costs).

The overall under-spend in the project budget was anticipated during the summer 2006, when the detailed budget monitoring carried out by the beneficiary had indicated that this would arise, despite all of the project's objectives having being met on time. Hampshire County Council raised this with the Commission in a letter dated 3 August 2006, in which the under-spend was attributed largely to a combination of actual costs proving lower than estimated, partners using different approaches to implementing the project, which have proved more cost-effective (as outlined above), together with the effects of exchange rate changes (euro/sterling).

The Commission agreed with the County Council's proposal to continue working to the original budget contained in the application rather than submitting a request for an additional clause.
The final total project cost is calculated at €3,811,807 (with an under-spend of €772,456, or 17%), based on an exchange rate of £0.66845 /€1.00.

Partnership Budget Monitoring Report at 30 November 2006

Figure 5: Summary by expenditure type

Expenditure type	Project Bid (€'s)	Costs claimed (€'s)	Balance (€'s)	% Remaining
Personnel	2,227,113	1,788,543	438,570	20%
Travel	214,595	52,912	161,683	75%
External Assistance	1,348,409	1,433,037	-84,628	-6%
Durable Goods Building	0	0	0	0%
Durable Goods Equipment	381,206	200,877	180,329	47%
Land Purchase	0	0	0	0%
Consumable Materials	139,204	93,947	45,257	33%
Other Costs	88,838	77,539	11,299	13%
Overheads	184,898	164,953	19,945	11%
TOTAL	**4,584,263**	**3,811,807**	**772,456**	**17%**

Figure 6: Summary by partner

Expenditure type	Project Bid (€'s)	Costs claimed (€'s)	Balance (€'s)	% Remaining
Hampshire County Council	635,419	669,915	-34,496	-5%
Environment Agency	1,886,839	1,414,983	471,856	25%
English Nature	8,181	8,143	38	0%
Forestry Commission	1,826,682	1,526,003	300,679	16%
National Trust	166,099	143,711	22,388	13%
RSPB	61,043	49,051	11,992	20%
TOTAL	**4,584,263**	**3,811,807**	**772,456**	**17%**

9. Annexes

9.1 Log framework diagram
9.2 Agendas & minutes of Water Basin Management Forum meetings
9.3 GIS map of practical actions
9.4 Letter from English Nature re-site condition assessment, plus site list
9.5 Ober Water Geomorphological Dynamics Assessment
9.6 Assessment of potential effects of different grazing regimes in Wootton Coppice and Holmsley Inclosures
9.7 Communications co-ordination and publications
9.8 Dissemination/publicity list
9.9 End of project event details
9.10 Forestry Commission event figures
9.11 Layman's report
9.12 Agendas & minutes of Project Management Team meetings (Feb – Oct 2006)
9.13 Partners' technical reports (February - October 2006)
9.14 List of surveys, reports & partners' data produced
9.15 Forestry Commission monitoring results
9.16 Geomorphological survey report
9.17 Topographical data & maps
9.18 Hydrological monitoring report
9.19 Macro-invertebrate community response to river restoration in the Upper Lymington
9.20 Fisheries response to restoration
9.21 NT monitoring report
9.22 Before/after photos in photo index (vol. 2)
9.23 Project film (DVD)
9.24 After-LIFE conservation plan (Wetland Management Plan)
9.25 Wetland Management Plan - Practitioner's Guide